Hand to Mouth Buying

THE ultimate consumers of commodities control the volume of business in this country.

The purchasing power of these ultimate consumers is limitless.

Their consuming ability is the greatest on earth.

There are about 23,400,000 homes in the United States presided over by about the same number of women.

This is just one class of purchasers and they spend on the average $600 per home per year.

Almost $15,000,000,000 in the aggregate spent for commodities a year from the housekeepers alone.

Controlling so vast a sum, these consumers are worth cultivating. The producers of commodities are now catering to their wants. That's a wise policy.

Now, these ultimate consumers know they are living in a new era.

They know that this is the age of invention and improvement.

They know that this is the era of power and mass production.

Therefore, these consumers are not quantity buyers.

Let us illustrate.

The great majority of the householder consumers want to keep abreast of the times and styles.

They verily believe that to be out of fashion is to be dead. They want to live.

They know fashions and styles change—change frequently and quickly. Dresses may be one-piece suits in early fall and two-piece styles for early winter. Skirts may be twelve inches from the floor today and fourteen and one-half inches sixty days from now. She doesn't know, but she is going to follow the fashion. How can she do it? Purchase sparingly. A pair of stockings to match an early fall dress instead of a box of stockings. Every item of woman's apparel is affected by style and fashion and every woman wants to possess the latest style and fashion in every item of her apparel. She buys apparel, shoes, coats, even galoshes of the latest style on the hand to mouth basis. She can keep in style by frequent purchases. She goes out of style by large purchases. She's in fashion.

Every article of her home is subject to change. New styles of lamps, fixtures, furniture, toilet articles, pictures, beds, bedding, dishes, and even kitchen utensils.

She wants the latest, the best, and as improvement succeeds improvement, she is the potential purchaser.

As with the householder class, so with every other class of consumer.

Everyone feels the pulse of new times, new things, better facilities, new standards of living and radical changes from the old. They want the improved, the new, the latest.

No old style shop worn goods at any concession whatever in price tempts the ultimate consumer today to buy.

Now the retailer knowing these facts has grown cagey. He liquidated old stock long ago. He sounds and senses out the desire of the consumer. He also buys sparingly and frequently, refusing to run any risk whatsoever of being caught with obsolete stock on his hands.

So, also with the wholesaler. Why should he carry a six months' stock for a thirty day demand and be caught with unsalable merchandise?

Therefore, it gets back to the factory and mill man, and then, on to the raw material supplier.

No change in merchandising methods since the War is fraught with such far reaching consequences to the merchants, jobbers and commodity producers as the hand to mouth buying policy—that they must adjust to it, is certain.

The ultimate consumer will only buy in such quantity as he chooses. He will buy when, where and of whom he will. He wills to buy as he needs, from week to week. Business will adjust to the consumers' will.

But how about staples? Staples are not influenced to any degree by style and fashion.

True! But while the great majority of commodities are affected by the changing, improving era, and the method of hand to mouth buying is in vogue, staples are affected also. The thing that has extended the hand to mouth buying to staples is the desire for rapid turn-overs by the merchant. He buys staples frequently in small quantities, turns them over often at a short profit, which enables him to reduce prices to his customer and so please him.

Then, again, the almost perfect functioning of the transportation systems has favored this new policy.

Prompt railroad delivery of goods and quick auto service has materially helped.

What does it all mean? Is this new method an improvement over the old merchandise practice? Will it become the fixed method in the future?

We answer the last question first by saying "yes."

Hand to mouth buying is just another way of expressing the changed method. It means that emphasis now has been transferred by the merchants from "buying goods" to "selling goods"—from "stocks" to "turn-overs."

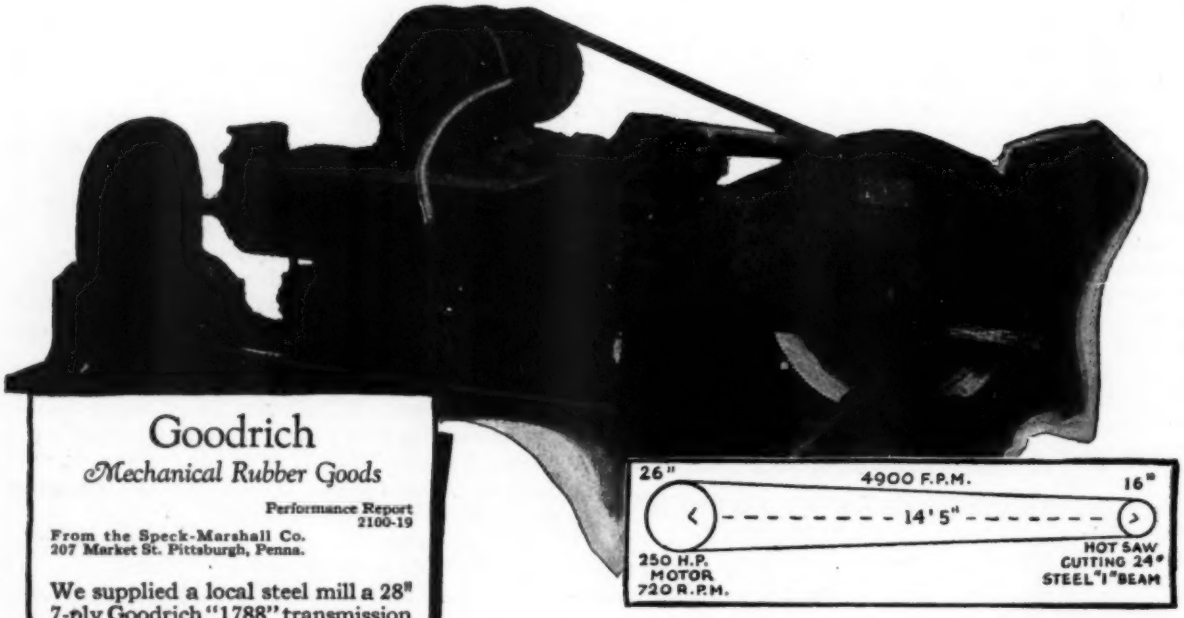
Formerly, "goods well bought were half sold." Merchants adopted that policy, and relied upon shrewd buying to give them profits. Today, high grade selling is the only dependable source of profit.

No good merchant today will buy more of an article than he thinks he can dispose of in six weeks. He must see a very great concession in price before he will jeopardize his turn-over. And prices have been forced so closely to costs today that there is no opportunity to make the merchant such tempting concessions. Automatically, therefore, the hand to mouth policy is being economically enforced.

The great benefit to business generally lies in the fact that the hand to mouth buying has resulted in the safest, sanest, most stabilized commodity situation we have seen since the War.

Hand to mouth buying has curtailed over-produc-

Belt-testing Drives of Industry



Goodrich

Mechanical Rubber Goods

Performance Report
2100-19

From the Speck-Marshall Co.
207 Market St. Pittsburgh, Penna.

We supplied a local steel mill a 28" 7-ply Goodrich "1788" transmission belt, made endless at the factory, which was installed on a hot saw January 1. Previous to that time they had been using Hot Saw belts fastened with steel fasteners which gave an average service of about 30 days.

This was the first "1788" Endless belt they had tried. It has been operating continuously for nearly six months and is in excellent condition. It shows little or no stretch.

This is positively the most severe service we know of for a transmission belt.

The Hot Saw

Driving a saw cutting 24 in. steel girders, this Endless Goodrich "1788" belt has lasted six times longer than belts previously used. It is an example of what Goodrich belts, properly applied, are doing on hard drives in all industries—what they can do to help you solve *your* transmission problems.

THE B. F. GOODRICH RUBBER COMPANY
Established 1870 Akron, Ohio

Goodrich

Transmission BELTS

"Best in the Long Run"

tion. No intelligent producer of commodities will over-produce in face of a week to week demand. He's sunk if he does, and pays a sad price.

Witness the cotton and board over-production and consequent conditions.

Hand to mouth buying has liquidated all excess inventories. No sane merchant carries a six months' stock for a fifteen day demand.

Of course, he wouldn't pay six months' interest to the bank on a fifteen day note.

Now, we come to the end of the trail of 1926. With over-production curtailed; with manufacturers adjusting to the demand of orders received from week to week.

Jobbers and retailers have liquidated excess stocks and will close the year with the smallest inventories on record.

The year's volume of business has been stupendous. The aggregate of all this frequent buying has been the largest on record, but it has all gone into immediate consumption.

Therefore, facing 117,132,000 consumers this coming year, committed to the policy of buying from week to week as they need or desire the goods, with the smallest inventories on record, no excess stocks to liquidate, how can we have a liquidating market?

The ultimate consumer is the supreme market maker. He has regulated our processes of producing and merchandising. He has brought stability to our markets and is helping us to work out a good fair profit from our yearly service to him if we but learn how to adjust.

The volume of business is supplied us by the ultimate consumer; it is up to us to get a profit for handling it.

A Holiday Thought

AS THE year comes to its close, attended by those wonderful days of Christmas cheer, when all hearts are inspired and filled with that sublime truth, "Peace on earth; good will toward men," we can not refrain from expressing these few words of joy in the work which engages us.

During the few years that have been the life of this magazine, we have seen the manufacturing industry of pulp and paper grow from a state of closed hand policies of considering ideas the sole possession of those who held them, to a day of realization that ideas can not be confined and are the property of all.

Conventions of the various associations in this industry are being known and characterized by general indulgence in free and liberal discussions of ideas and methods. Thinking men in all departments of activity in pulp and paper manufacture are giving liberally of their time and intellect to the preparation of valuable, educational articles for publication.

For the good will which comes to us from all sides, the encouragement and cheer to carry on effort to produce a magazine of which the industry is proud, we are truly grateful. We extend to all our readers, advertisers and contributors our best wishes for a Merry Christmas and a Happy New Year.

The Paper Industry Safety Contest

THE third, annual, no-accident contest open to members of the National Safety Council, in which THE PAPER INDUSTRY will award a grand prize loving cup, as explained in the following rules, will begin January 1, 1927. The important changes which make this forthcoming contest different from that of the year 1926, are the divisions of the mills into three groups depending upon the number of employees, and the changes in the scale of time charges for deaths and permanent injuries, which table will be found on page 1557 of this issue.

Each group will compete for a separate silver cup (donors to be announced later) and to the winner of all three groups combined will be awarded the additional grand prize cup donated by THE PAPER INDUSTRY.

Each mill will now be on an equal basis with other mills in their group and every entrant has a sporting chance to win a prize.

An indication of the popularity that the forthcoming contest will enjoy is shown by the fact that about thirty mills which have not participated in either of the last two contests, have already signified their intention to be included in the next.

As Chairman Peacock says, "Your chance to win depends upon your success in selling the safety idea to your organization and obtaining their coöperation. Let's go for NO ACCIDENTS."

Rules Governing Contestants

1—This contest is open to all members, Paper and Pulp Section, National Safety Council, employing more than 20 employees and manufacturing pulp, paper, container board, strawboard, plasterboard, etc.

2—Contest shall be divided into three groups, namely:—

Group A—Mills employing 501 or more employees.
Group B—Mills employing 201 to 500 employees.
Group C—Mills employing 20 to 200 employees.

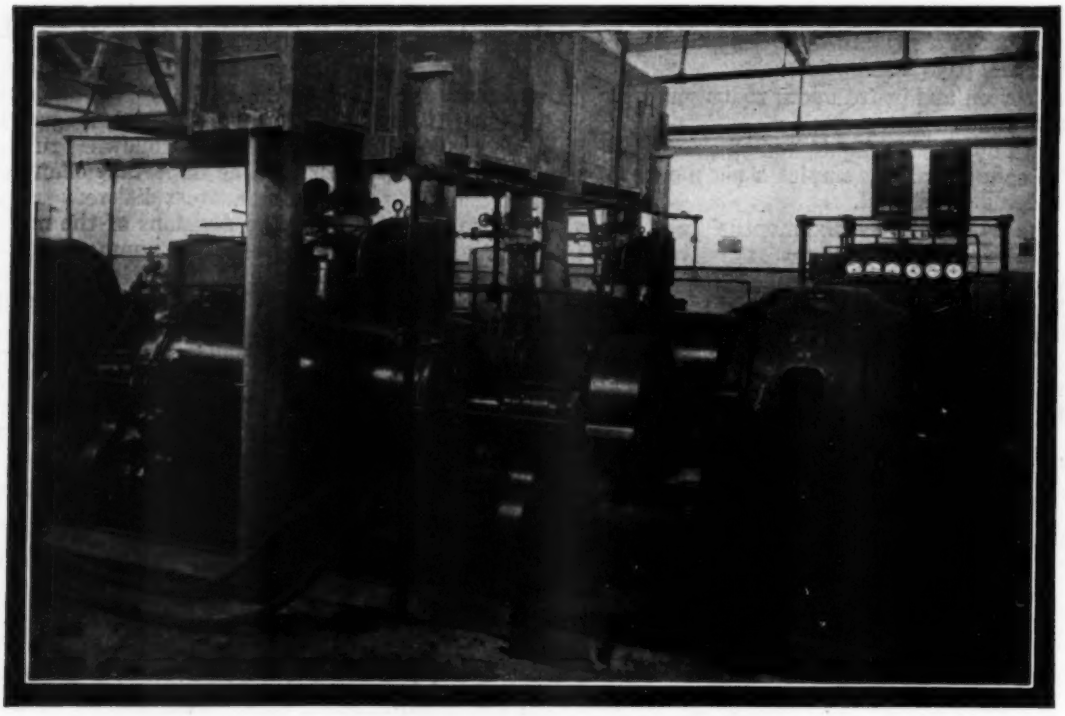
3—Contest shall start January 1, 1927, and end June 30, 1927. However, should two or more mills in any one group be tied for first place, as of June 30, the contest for all contestants in said group shall be extended until the tie is broken.

4—The winner of each group shall be the mill having the lowest accident severity rate (days lost per 1,000 man-hours worked), in accordance with the rules and the "Scale of Time Charges for Deaths and Permanent Injuries," as listed on page 1557. See also Notes 4a, 4b, and 4c on page 1557.

5—A lost time accident shall be any personal injury which comes within the scope of Note 3 on page 1557. This is interpreted to mean that injured employes **must return to their regular occupations**—not just be given some lighter job in order to report a clean record.

6—All lost time shall be charged to the month in which the accident occurred—See Note 4c on page 1557. However, corrections may be made in previous reports, when the corrected report has been

(Continued on Page 1541)



A Survey Directs the Way

—*to Lower Costs*

THE Bryant Paper Company wanted more efficient operation. Their first step was to make a complete survey of conditions and requirements. It was made under the direction of Mr. V. D. Simons, consulting engineer, and from the data obtained they based their choice of equipment.

The Jordans are driven by direct-connected Westinghouse synchronous motors. Being direct-connected, belt strain on the Jordan bearings is eliminated—the plug remains in a concentric position and bearing replacements are infrequent. Being synchronous, the motor has a high power factor. Being Westinghouse, the motor has high efficiency and sturdy construction—power cost and maintenance expense are low. Being individually motor driven, the amount of work being done in the Jordan is indicated with an ammeter—more exact control is made possible.

Selecting Westinghouse synchronous motors for Jordan drive is good engineering because Westinghouse motor engineering synchronizes with paper mill requirements.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse

X90159

Synchronous Motor
Jordan Drive

THE PAPER INDUSTRY

REG. U. S. PAT. OFF.

Vol. 8 DECEMBER, 1926 No. 9

Power Problems in the Paper Industry

By EDWARD P. GLEASON
Chief Engineer, Nekoosa-Edwards Paper Co.

This article is written primarily for the executives and superintendents of paper mills, with the idea that more attention be given to the power problems in the industry and that part of the organization responsible for same.

FROM observation and from articles in the leading paper magazines, it is evident that the new mills that are being erected in this country and in Canada are getting a high grade of engineering supervision. It is equally evident that in many mills in this country, the power problems are still very much neglected and offer a field for decided improvement with good returns for the investment necessary.

We cannot forget the statement made by a prominent foreign engineer, who was asked this question, "What impressed you most on your trip through the American mills?" He replied, **"Your waste in this country is more than our profit."** We believe that the American industry can and will of necessity turn this **waste** into **profit** and that the engineers of the industry with the support of the executives in charge of the mills will do their full share in accomplishing this result.

The cost accountant is necessary in this work and the engineer must know costs and salesmanship to effectively present the weak points in any particular mill to the management.

Chemical control is of vital importance in the modern mill and its field of activity should be covered in a separate article.

Power Cost and Conversion Cost

The following figures indicate the relative importance of power in conversion cost:

Table I—PAPER MILL

	Per Cent
Electric power	10.5
Steam power	15.7
Labor	23.3
Repair labor	6.1
Repair material	4.4
Supplies	0.1
Machine clothing	12.1
Wires	2.2
Fixed charges	25.6
	100.0

Table II—SULPHITE MILL

Electric power	8.1
Steam power	26.0
Labor	26.2
Repair labor	4.8
Repair material	9.6
Supplies	1.6
Water	2.1
Wire and felts	3.1
Fixed charges	18.5
	100.0

You will note that the power cost is 25 per cent in the paper mill and 35 per cent in the sulphite mill of the total conversion cost and that it is, in both cases, greater than the labor charge.

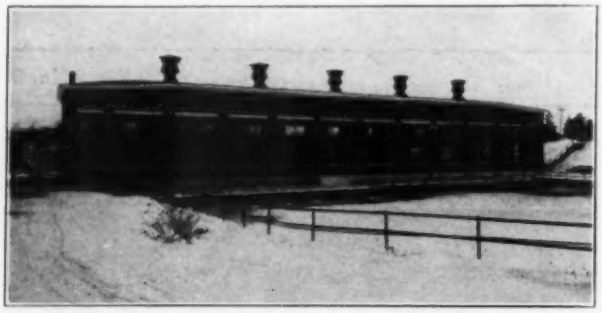
Organization

Manufacturing conditions in all industries have changed very rapidly since the war and the paper industry is no exception. Changes and improvements have been so rapid that the engineering department, almost unknown in the paper industry ten years ago, has been firmly established with the management of the larger companies. Such a department in charge of power and engineering work should be carefully considered by the smaller and older mills even though this department consists of but one man with reasonable training along the lines of modern power plant practice and cost accounting.

On a larger scale, the engineering department

would include on its technical staff a trained civil engineer, steam and mechanical engineer and an electrical engineer to properly cover these three major branches of the work.

The ideal condition is where the engineering department covers not only the design and construction of new work but also has direct charge of the production of steam, electric, and hydraulic power



Nekoosa-Edwards Paper Co. Centralia Hydroelectric Plant

and follows this power through the mill to its final use. The engineer cannot produce results unless plans and methods are properly carried out and the authority to have this done seems to be most easily accomplished by making this department responsible for the actual operation of the power plants.

In many of the older mills, the superintendent is still in charge of all departments taking care of purchasing, labor, power, plants and machine shop problems and many times neglecting the real and important problems of making paper. With the improvements and changes in the making of paper, the superintendent is a paper specialist and needs all of his time for his special work. He leaves his labor problems to the employment department, his steam and power problems with the engineering department, chemical control to the laboratory, and depends more and more on these departments and the cost accountant to help him reduce the cost of production.

To emphasize the character and variety of the mill problems, we will discuss briefly the following subjects:

1—Hydraulic power.
2—Hydroelectric power.
3—Electric distribution and measurement.
4—Electric Motors and Drives.
5—Boiler Room Operation.
6—Steam Turbines.
7—Steam Distribution and Measurement.
8—Paper Machine Drives.
9—Water Supply Pumps and Piping.
10—Heating and Ventilating.
11—Safety and Industrial Education.

Hydraulic Power

Many of the older mills obtained a large proportion of their power from direct connected water wheels and many are today operating wheels that are from twenty to thirty years old. Recent tests made by Prof. C. M. Allen of Worcester, Mass., on actual wheels in the Wisconsin Valley show efficiencies of less than 55 per cent, though the wheels are apparently in good condition. His tests taken before and after wheels were sandblasted and painted shows an increase in power of nearly 10 per cent.

Modern wheels of the horizontal type in open flumes in the same mills with very ordinary settings show efficiencies of 83 per cent.

This means that where 55 tons of pulp was formerly produced, the same water now produces 83 tons of pulp. It is the duty of the power department to see that wheels are properly cleaned and painted and that obsolete inefficient units are removed as conditions will permit. In two water wheel driven beater rooms, the power cost per ton is 30c and 35c; in a similar motor driven beater room the cost 90c. It is obvious that there is no power cheaper than direct connected water power and this type of drive should be used wherever possible.

Hydroelectric Power

The standard generating unit twenty years ago in lowhead plants was a horizontal wheel of a now inefficient type direct connected to horizontal generator.

Today the most efficient unit is the single runner vertical water wheel with umbrella type generator mounted above same and with efficiency guarantees of approximately 90 per cent.

There has been some tendency to make hydroelectric installations too elaborate and to over develop water power sites and the final cost of operation should be very carefully compared with good steam plant operation in the district considered. This ap-

Nekoosa Turbine and Switchboard

plies particularly to lowhead installations and the statement has been made by a prominent steam plant operator in Wisconsin that there is no economical reason for developing lowhead water power plants

in Wisconsin. His idea is that we have been over enthusiastic in developing natural resources and have perhaps overlooked the rapid development in steam practice.

However, hydroelectric development of the proper type and size will always be profitable and should be carefully considered wherever possible.

Electric Distribution and Measurement

After the electric power is generated by either hydraulic or steam power, the distribution system should be carefully laid out particularly with a view to future expansion.

One mill that the writer has in mind was laid out in 1913 and every circuit had an allowance for double the original load. Now in 1926, practically every circuit is loaded to capacity and additional circuits have been installed in some departments.

The ideal system is a central distributing board with ammeter, automatic oil circuit breaker, and watt-hour meter on each circuit and with one or more circuits to each department as required. This gives exact measurement of power and assists materially in the cost accounting detail that the modern management demands.

All meters are subject to error and the well designed system has a master meter which checks the sum of the distribution meters and enables the electrical account to be balanced each month. If the sums of the distribution meters do not agree with the totallizing meter the individual meters can be checked and the error found. Without such a checking system, it is impossible to guarantee accuracy and we consider this very essential.

Electric Motors and Drives

Practically all American mills are operating with three phase, 60 cycle, 440 volt electrical distribution

Nekoosa-Edwards Paper Co. Centralia Hydroelectric Plant

and, considering the moisture present in paper mills, this seems to be the best standard practice today.

A few years ago standard motors seemed sufficient, now all motors going into acid plants and similar places are especially treated, and more and more totally inclosed motors are being used in places such as sulphate wash rooms, digester chip bins, etc., where fumes or moisture conditions are particularly bad.

Water is probably the greatest enemy of the elec-

Port Edwards Engine Room—Distributing Switchboard

tric motor and all motors should be covered where there is chance of water dripping on same.

While remote starters are quite generally used, we consider it the best practice to have the starters close to the motor wherever possible, as the man operating the motor will know if trouble develops, and will save.

Practically all mills operating any number of electric motors have motor tenders on duty twenty-four hours a day. It is the duty of these men to continually travel through the mill taking care of the motors and drives, watching and oiling motor bearings and taking care of the lighting systems in the mills. These men by locating minor troubles and taking care of them before they develop seriously prevent many shutdowns and are prepared to handle serious troubles promptly should they occur. The auto call system covers the entire mill and these men are always available through same.

Boiler Room Operation

It is probably unfortunate that the life of a well built boiler is from 20 to 30 years and that it must be maintained in first class condition in order to operate at all.

Improvements in boiler and furnace design have been so rapid that most of the boiler rooms ten years old are now obsolete although they may be in first class mechanical condition and it is very difficult for the power plant operator to convince the management that good equipment should be discarded to save labor and repairs or to bring up operating efficiency. Being a "paper mill," the paper superintendent gets first consideration when there is money available for improvements, and the power department must use diplomacy and salesmanship to get a place in the annual budget.

This problem is probably the most serious in the

paper industry today and the possibility for improving boiler room operation should be given the closest study by the plant engineering department as well as by outside engineers where it is possible to obtain them.

In boiler room operation itself, the improvement in meters, control apparatus and the development of air preheaters, economisers, etc., has made it possible to operate even old boiler plants at relatively high efficiencies.

We have in mind the two boiler plants in our own mills where practically no money has been invested in the past ten years on major improvements but which have increased in efficiency nearly 12 per cent in the past five or six years.

Boiler efficiency meters on each unit are aboslutely essential and a master pressure gauge with coarse

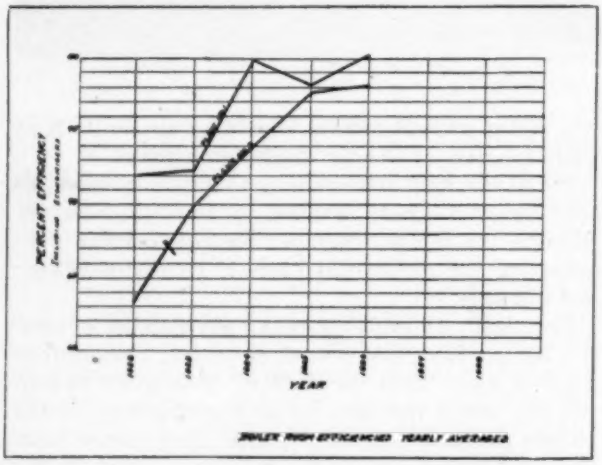


Figure 1

graduations is a material help to the fireman in preventing waste of steam through safety valves and in maintaining steam pressure for sudden demands.

Automatic controls of many kinds have come and gone and while they have good features and are now reasonably reliable they are not the "cure all" generally supposed and cannot take the place of care and interest on the part of the operating force. Our experience has been generally unsatisfactory and we are getting higher efficiencies and lower costs with intelligent hand control supplemented by some automatic features.

There is probably no problem that is more important or has had less intelligent attention than the problem of boiler feed water. In former years, when the streams from which feed water is usually obtained carried tannic acid from logging operations and were relatively free from manufacturing pollution and boilers were not forced to high ratings, this problem was fairly simple.

With the obvious changes in the above conditions and with the higher ratings demanded of boilers, feed water became a serious problem and the market was and is flooded with boiler compounds which are makeshifts at the best and which in the majority of cases are absolutely waste of time and money.

The only real remedy for boiler feed water is external treatment and the quicker that the plant operating force and the management realizes that water softeners are available that will really take care of this problem, the quicker will this extremely annoying and expensive problem be satisfactorily taken care of.

The quality of labor and supervision in a boiler plant is of great importance and the men on the crew should be picked just as carefully as the men in the machine rooms. In the paper industry the rate of pay for boiler room men has been very low. In many plants the head fireman gets only two or three cents more than common labor and his work not only is hard and dirty at times but there is also more responsibility than the management realizes in the safe operation of the boiler plant.

The personality and interest of the boiler room crew can easily make or lose more than the entire amount of wages involved in the operation of the boiler room itself in efficiency and in repair cost, and in most mills today great improvements can be effected along this line without any great expenditure for equipment.

To illustrate this, Figure I shows the change in efficiency in two boiler rooms over a period of years brought about primarily by two things:

1—The installation of boiler efficiency meters and similar equipment.

2—By an intensive educational program with the boiler room men.

In one year's classes on boiler room operation, the average attendance was 85 per cent of all the men on the boiler room pay roll, from the head fireman to the ash wheeler. This was the year 1924, and the results show quite plainly on the efficiency curve.

We cannot emphasize this matter of boiler room operation too strongly as we feel that the biggest showing can be made in this line with the least expenditure of any one point in paper mill power.

Steam Turbines

Steam turbines have been used for many years for primary power as well as for hydroelectric auxiliaries and until a comparatively few years ago were of the condensing type usually in fairly small units and with only moderate efficiencies.

The later developments of the bleeder turbine with multiple pressure extraction, high steam pressures and automatic control have brought the new units into favor with the paper mills and many such units are being installed in both old and new plants.

The turbine is an ideal unit as refers to first cost, efficiency on high vacuum, floor space and maintenance.

The bleeder feature on small units, however, is not

as attractive as appears at first sight due to the fact that the efficiency on high pressure and in many cases where bleeder pressures of 25 pounds or higher are required, it is actually cheaper to run the unit condensing to carry the required load and to use live steam in place of bleeder steam. This is, of course, entirely a local condition but the writer knows of several cases where the installation was very disappointing in actual results where the original prospects for savings were very bright.

Steam Distribution and Measurement

It is only within the past few years that steam has been metered to the major departments in a paper mill and there are few mills today that meter to each individual paper machine. In fact, steam metering has been far behind electric metering in development and in popularity. We feel, however, that the time has come when steam meters are of sufficient reliability to warrant more installations and these are very necessary to give the management and cost accounting department the data they require. We have been accustomed in this industry to meter each small electric circuit involving 100 h. p. or less and to neglect entirely the metering of steam lines that carry many times the value of corresponding electric circuit.

Paper Machine Drives

Without question, the electric drive has been of the greatest value in developing the high speed news machines now being installed in this country and Canada, and the smaller single motor paper machine drives as applied to older and smaller machines has been valuable in assisting in obtaining proper regulation and control of paper machine speeds. However, the writer feels very strongly that the combined advertising power of the large electric companies has converted many mills to this drive at a loss in efficiency and increase in cost, and we believe today that the pendulum is swinging back to engines on paper machine drives where the speed is moderate, excessive speed variation is not necessary and where operating cost is important.

If you start with steam from the boiler plant, put this steam through a turbine generator, carry the electric power to motor generator set and from there to the variation speed D. C. motor on the machine, you have a loss that is fully 25 per cent more than taking your steam direct to the paper machine driving with variable speed steam engine and using the exhaust in the drying cylinders, and if this 25 per cent in power cost on the paper machine is valuable, this method will remain in favor until new developments wipe out the difference in cost. Also the investment on the engine drive is far less than the electric drive and is fully as reliable.

This statement will not meet with favor among the electrical manufacturers and in some cases may not be entirely correct but we hope that it will stimulate interest in the problem, and we are reasonably certain of our statements from several detailed investigations where both the electrical manufacturers and the steam engine builders have worked on the same problem.

Where it is considered necessary to have the control and regulation of the variable speed drive, the steam engine should be considered as a constant speed drive with an engine large enough to give the majority of the exhaust steam needed for the paper dryers.

Water Supply Pumps and Piping

The problem of obtaining adequate supplies of clean water for manufacture of pulp and paper is getting more attention in this country, especially with the mills that are being forced to higher grades of paper than they have in the past.

We do not know of any problem that is more complicated or easier to make mistakes in than this one. It is very easy for a well drilling concern, a manufacturer of sand filters or an engineer interested in developing surface water supplies to promise wonderful results. Many mills have discovered to their sorrow that these results do not always come out as expected, as the chemical analysis of the water, particularly along the lines of iron and magnesium content, is very important and usually cannot be detected by casual observation or by a few laboratory tests, and in developing a water supply we would urge that the best water chemists obtainable be employed on the problem and a reasonable amount of time spent in investigation and engineering work before a development is started.

We speak from experience in this matter as we have just been through a two-year period of water supply development, and only the most careful and thorough investigation of the various supplies and methods offered led to what we believe was the correct solution of the problem.

The matter of mill pumps and piping is one that is sadly neglected in many of the older mills. You cannot estimate efficiency of a pump by looking at it, and it is not a simple problem to measure the discharge of a pump without special equipment, but the time and money involved in making such pump tests will usually lead to extensive savings in power cost and in an elimination of duplicate equipment.

We have in mind one mill where there was a fresh water pump belt driven from line shaft on each of four paper machines. In addition, the water supply came by gravity through screens into a large pump which fed the four paper machine pumps. All five pumps were replaced by one high efficiency motor-driven pump which had a final operating cost of just one-fourth of the previous system, and we might add that the mill management thought they had a first class water system and were quite opposed to making changes in same.

This again emphasizes the fact that the power de-

partment must be somewhat skilled in cost accounting and in salesmanship to present such problems to the management in a way that will bring about the required changes.

Heating and Ventilating

This is obviously a problem that requires the co-operation of the power department and the mill superintendent and the results can only be accomplished by such co-operation. Under the old system, the power department took the attitude of a public utility which furnished steam for heating and process to mill superintendent, and he used it either wastefully or economically at his option and paid the bill accordingly. In the spring of 1922, the power department put on a heating inspector whose time is spent on the heating and fire system and who is con-

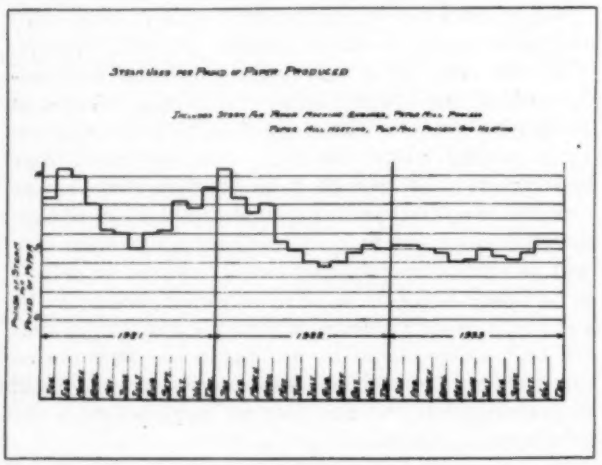


Figure 2

tinually traveling through the mill, adjusting heating to meet the constantly changing weather conditions. The results are shown in Figure II. You will note that before the heating inspector was put on that the pounds of steam per pound of paper ran from five pounds in the summer months to as high as ten pounds in the winter months, and that since the heating inspector was put on, the highest month went to six and one-half pounds of steam per pound of paper, with such an effect on winter power cost that there has never been the slightest suggestion to change the system, and it was, of course, adopted at the other mills.

Safety and Industrial Education

Safety and industrial education are subjects handled by a separate department but are too important to go unmentioned in this article. The power department handling the steam plants, steam engines, electric generation and distributing systems, motors and construction work needs to use all the safety measures possible to keep down its accident record and should encourage every phase of safety work.

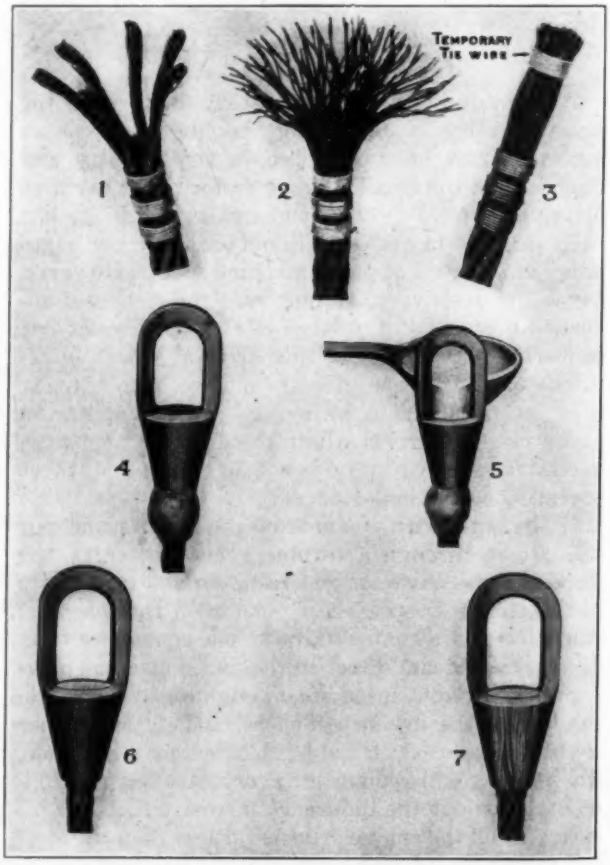
The power department of this company has been conducting classes in electrical work, power plant operations, study of operating costs, etc., for five consecutive years with results that have been very satisfactory and have well repaid the pioneer efforts put forth in this line. This work has been in co-operation with the Extension Division of the University of Wisconsin which deserves a great deal of credit for its co-operation along this line.

In one electrical class two years ago, every individual on the electrical pay roll of this company, with one exception, was enrolled—some twenty-four men; and this man is now selling life insurance.

This means that industrial education is taking a permanent place in the organization of the modern paper mill and is becoming more important with the advent of more complicated equipment in both the handling of power and paper products.

How to Socket Wire Rope

IN socketing a wire rope, measure back from the end of the rope a distance equal to the length of the tapered basket of the socket. Tie securely at



this point with soft iron annealed wire and add two additional tie wires below the first.

Open up the strands as in Figure I of the accom-

panying plate, and cut out the hemp core as far down toward the tie wire as possible. Unlay each wire and straighten so as to form a "brush" as in Figure II. On large ropes and heavy wires, it would be necessary to place a small pipe over each wire to straighten or approximately remove the curl from the wire.

If the wires are very greasy, hold the "brush" over a pail of gasoline (with the wires held downward) and wipe off the grease with waste or a paint brush dipped in the gasoline. Wipe dry, using a clean rag or piece of waste.

Dip the "brush," still holding the wires point down, into a pot of muriatic acid solution (50 per cent water and 50 per cent commercial acid). Insert the brush to a depth so as to **not** immerse the end of the hemp core. Keep in the acid until the wires are clean. Still holding the wires downward, withdraw from the acid and knock the rope sharply with a stick (broomstick or hammer handle).

Place a temporary tie wire, as in Figure III, over the ends of the brush taking care not to handle the cleaned wires with greasy hands or tools.

Insert the rope end into the socket, then cut the temporary tie wire.

Set the rope vertically in a vise; adjust the socket so that the wires come flush with the top of the basket of the socket, then spread the wires out. Seal the bottom of the socket with fire clay or asbestos as in Figure IV. (If cold, warm the socket moderately.)

Pour with pure zinc (not babbitt, lead or other alloy) as in Figure V. Tap the side of the socket with light hammer while the zinc is still fluid, so as to jar the zinc into crevices between the wires. When cool, remove the fire clay and the serving wires, and the joint, as per Figure VI, will result. It will help slightly in the flowing of the zinc among the wires to put a small quantity of salamoniac crystals over the wires just prior to pouring the zinc.

Figure VII shows a phantom view of the zinc cone with the imbedded wires.

Lessons in Paper Making

Lesson VII—Suspension of Fiber—Slice Velocity

By HARRY WILLIAMSON
Class Instructor, Champion Fibre Co.

The author has given the reader a practical understanding of the mechanical features of drying and operating the clothing pertaining to it, in the first six lessons of this series. Lesson Seven begins a new group dealing with actual manufacture of paper. These lessons are a part of the general educational course conducted by the Champion Fibre Co., Canton, N. C., under the direction of J. Norman Spawn, educational director. They are appearing each month in THE PAPER INDUSTRY *by arrangement with this company.*

DELIVER the STOCK in suspension at a speed slightly faster than the horizontal speed of the wire, so that when the fiber ceases to be held in suspension and becomes a homogeneous sheet of paper, it shall conform evenly across its width to the speed of the wire without a displacement of the formation of the felted fibers.

This can be accepted as a general rule for all speeds over 200 feet per minute.

In so far as the slices are concerned with formation, the **speed** at which they deliver the volume of water and stock, either over the whole deckle area, or any proportionate part of it, is controlled by the volume or weight of water and stock behind the slice and the width of the opening between the edge of the slice and the apron.

Before proceeding to discuss further the function of the slices, it will be necessary to digress a little and get clearly in our minds the materials with which we make a sheet of paper, and the tools we have to work with.

Our materials are **stock** and **water**, and our tools are **water** and **machines.**

By the trade term **stock,** is meant the fiber itself, whether it be composed of wood, linen, rope, cotton, or any of the **cellulose** from which paper is made, and the dyestuffs, filling, sizing and setting elements added to it. Thus, the term **raw stock** implies the fiber as delivered to the beater without any of the other elements added, and **stock** implies the completely mixed and prepared fiber ready to be delivered to the paper machine.

By **water as an ingredient** is meant that water which becomes a **physical component of the fiber** by the process of hydration during its preparation for the paper machine.

By **water as a tool** is mean that water which is used as a control of density during the beating and jordaning, as a medium of transportation to support the fiber in suspension in transit through pumps, sand, traps, etc., and most important of all, **as a medium of support and travel to the fibers while they are being woven and molded into a sheet of paper** on the wire.

The necessity to keep clearly in mind the distinction between water as an ingredient, and water as a

tool, becomes at once apparent if we remember that **water of hydration the ingredient,** can only be removed by suction, by pressure, mechanical, or steam, and a percentage of it, averaging 6 per cent, is a **final component of the paper,** commanding the same price per pound as the fiber.

Water used as a tool to control the degree of density during the preparation period, is a close collaborator with water of hydration. Indeed, it is a very definite and important factor, deciding as it does the degree to which such hydration shall be permitted to take place, and the amount of power to be consumed to produce such hydration.

In this lesson on slices we are more chiefly concerned, however, with water as a tool, used as a medium to hold the fiber in suspension until we have formed a sheet of paper.

Fiber in Suspension

The stock as delivered to the control gate of the fourdrinier machine has usually a density varying from 3 per cent to 5 per cent. Water is added, altering the density to degrees varying between 0.5 per cent and 1.5 per cent, according to the speed of the machine, which in turn is controlled by the basis weight of paper to be made.

Thus, when making a sheet of news at a high rate of speed, the volume of stock and water behind the slice would be in the proportion of 99.5 per cent water and 0.5 per cent stock.

When making an extremely heavy weight at a slow rate of speed, the proportion would be 98.5 per cent water and 1.5 per cent stock.

As the final product will be composed solely of this stock and its water of hydration, it becomes apparent that extreme care must be used to get an absolutely even distribution of the small proportion of stock throughout the much greater volume of water which supports it at the point of delivery to the machine.

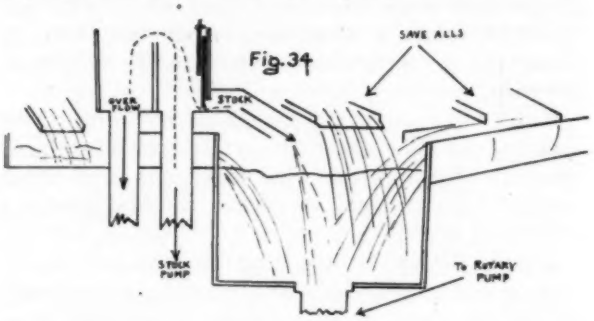
Although the praise for an even delivery of volume, and conversely the blame for uneven delivery is generally attributed to the slices, a great deal of both depends on the construction of the Head Box and also further back still, to the method of delivery to the screens, and from the screens to the Head Box itself.

If we define our objective, the means of attaining it will be clearer:

> The stock as delivered to the control gate is composed of dense bundles of fiber matted together.
>
> The stock as delivered to the wire **must be,** as near as possible, composed of **straight, separated, individual fibers** floating in suspension, evenly distributed over the **whole deckle area.**

The best means of insuring a thorough preliminary mixing of the water and stock is to feed the stock from the control gate directly to the box which receives the water from the save-alls.

The whole is then fed directly to the rotary pump delivering to the screen trough, the rotation of the pump insuring the mixing. (Fig. 34.)



This method is not much in favor with fine mills, the claim being made—with some truth—that the violence of the rotary pump on the stock materially affects the dye and filling retaining qualities of the fiber.

If this method is not used and the stock and water meet at the delivery trough to the screens, the only means of mixing together is the speed of the flow, and the distance the volume has to travel before the screen control gates are reached.

Therefore, make the **distance long enough** so that the stock and water are very thoroughly mixed before the **first** screen is reached.

The importance of this factor is very evident on heavy papers.

The total volume of water and stock used on slow speeds is much less, and the proportion of fiber to water much greater than is the case on high speed. If the mixing facilities are not adequate, the screens will work unevenly, one receiving a denser mixture than the other and causing a swinging variation of weight from side to side on the machine. In fact, it is quite possible to control the weight of the outside sheets by manipulating the control gates of the outside screens, rather than the slice, particularly if the volume is delivered directly from the screens to the back partition of the Head Box.

In the effort to eliminate possible lump formers and reduce the area required to be kept clean, sand traps and flow troughs are sometimes cut down to a point where more trouble is caused than eliminated. Like many other problems in papermaking, it all depends on the average quality of paper to be made.

If formation is a paramount requisite, then adequate flow troughs to facilitate the even distribution and suspension of the fiber must be provided.

There is no reason why such troughs should form lumps excessively. They should be made of close grained, smooth wood, or faced with copper. There should be no square corners which will cause the accumulation of dead pockets.

If dams are used, they should fit well into slotted

sides and have rounded tops. Similarly, the lower level traps should have rounded edges.

The question of clean flow troughs can be summed up quite briefly:

Smoothness, offering no resistance to flow.

Showers to prevent a rim of scum forming along the sides at water level.

Control

We divide the control of the fourdrinier machine into two parts. From the Breast Roll to the Reel, everything is running forward on a horizontal plane at any desired speed within the range of the motive power installed.

That is, the speed is **mechanically variable** and is usually known as the variable speed.

The whole of the delivery, screening, etc., up to the slice, is under the control of motive power running at a **constant speed**; that is, it is at all times throwing the full volume of its motive capacity.

The **amount** of volume permitted to enter the troughs is controlled by valves at the outlet ends of the pipes and the stock gate.

The advantage obtained by maintaining this full capacity load gives us a constant pressure of stock and water against their outlet points, which eliminates the fluctuation which would otherwise occur due to the pulse of the pumps and ebb and flow in the vertical pipes.

We have, therefore, behind the slice a volume of mixture which has no means of impetus except that imparted to it by its own weight forcing it through a restricted aperture.

On the forward side of the slice we have a wire mesh running at a horizontal speed of 500 feet per minute, upon which an evenly distributed amount of this volume must be maintained.

This then is the primary duty of the slice:

To act as a dam holding in leash a volume of mixture, the flow weight of which will equal the forward speed desired.

The term **flow weight** can quite conceivably act as our key in operating the slice.

If we impound a volume of water without outlet that body will exert its weight equally on all areas of impounding contact at its greatest depth, but will be quiescent and **still.**

If, however, we make a small outlet at the bottom of one wall, the whole tremendous weight exerts its pressure, giving a speed flow in ratio to the volume of water and the size of the outlet.

If we make the same size of outlet halfway up the impounding wall, we cut the speed of our flow in half, because we have only half the volume exerting the weight pressure.

We therefore get the following guiding rule:

The **greatest speed** is on a horizontal plane in line with the **bottom of the outlet.**

The second greatest speed is created by impetus of flow **down** the inside of the slice and at a point in line with the **top of the outlet.** (Fig. 35.)

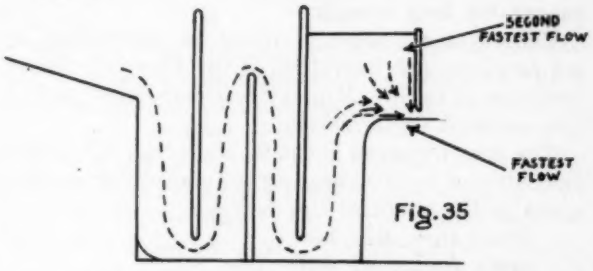


Fig. 35

Leaving out the question of the influence of long or short aprons, we have, then, two speeds of flow in the volume delivered to meet the speed of the wire.

These are termed the bottom or **wire flow,** the top or **slice flow.** At this point we must recapitulate a portion of the statement concerning our objective:

Deliver the stock in suspension . . . so that when the fibers cease to be in suspension . . .

There we have it. The fibers are in suspension in water which is being used as a tool—a medium of transportation.

Immediately when this volume meets the surface of the wire mesh, several simultaneous operations take place.

This water instantly begins to drain through the wire mesh, accelerated by capillary contact with the tube rolls.

Therefore, the **wire flow** almost instantly has its greater speed checked, the fibers nearest the wire gradually ceasing to be held in suspension and coming **first** under the full influence of the horizontal speed of the wire.

The greater the hydration of the stock, the individual fibers—containing a higher percentage of water as a physical component—offer a greater resistance to the loss of the water in which they are suspended.

The less the hydration, the lighter and more volatile the fibers behave under the influence of the slice pressure, offering little or no resistance to the loss of water in which they are suspended.

The instant the delivered volume is released from the slice, it comes under the influence of the **shake.**

The fibers tend to float lengthwise in the direction of flow, and the primary purpose of the shake is to offset this longitudinal inclination by shaking them crosswise and felting them together **while they are still held in suspension.**

It is therefore obvious that to have an adequately woven sheet of close formation, the loss of the suspending liquid must be gradual.

A too early settling of the fibers nearest the wire is a contributary cause to the rougher finish sometimes experienced on the wire side.

Should the penetration test for sizing qualities be up to standard, the reverse felt be in good shape, and

yet the wire side shows a feathery inking test, it can safely be concluded that the fiber has not had the full benefit of the shake; that is, it has **not been held in suspension long enough.**

The surface tension of water as represented by temperature, the hydration of the fiber for various qualities of paper, all play their important part in this question of formation.

The present lesson is chiefly concerned with **speed** as controlled by the **slice** and the controlling of small areas in the width of the deckle.

Stock slow, slice low.

Stock free, more water see.

If the stock by reason of its freeness settles too early on the wire, and it is not desirable to further hydrate the fiber, yet the same wire speed is to be maintained, more water will have to be put on.

A big increase in volume behind the slice would cause the delivery to be faster than the speed of the wire, resulting in a forward wave which would roll the fiber into lumps.

Under these conditions, the slices would have to be raised a little—the ultimate adjustment representing a greater volume delivered from the slice at the same ratio of speed.

Should the slice be raised without adding the extra water, the volume behind the slice would be proportionately decreased, resulting in the wire traveling faster than the delivery and causing a back wave which is equally as bad as the forward wave for forming lumps.

A sufficient volume must be kept BEHIND the slice to maintain a speed equal to the speed of the wire.

A sufficient volume must be delivered FORWARD of the slice to maintain the fibers in suspension long enough to get the full benefit of the shake.

The bottom edge of the slice is beveled in the direction of the flow. This adds a slightly greater speed, making the slice flow more nearly equal to the wire flow.

It is not advisable to bevel the slice to a knife edge. such an edge would easily become serrated by the

Fig 36

constant rush of the water and, moreover, tend to catch the finer fibers, giving the sheet a broken and unfelted appearance. This latter condition also occurs if the slices are worked too low.

The best results with the scissor slices are obtained by beveling the inside of the slice to about one-half its thickness, leaving a square edge to come in contact with the flow as it assumes the horizontal speed. (Fig. 36.)

Slice Adjustment

The scissor slices are equipped with four adjusting screws, one on each side and two flanking the center. Theoretically, the edge of the slice should be kept an equal distance from the apron over the whole width. Due to local conditions such as currents, pressing and drying troubles, this is not always possible.

Use of the adjusting screws should be delicate and the results carefully noted. Water will run to the point of least resistance. If one side of the slice is put down, not only will the volume delivered at that point be decreased, but a current will be formed tending to increase the volume delivered at a point slightly away from the point where the slice was put down.

If the center of the slice is put down, using both adjusting screws equally, there will be a corresponding increase of the volume delivered to the outside edges.

The scissor slice is made in two halves crossing in the center, and its action in operation is similar to that of opening and shutting a pair of scissors.

The adjusting screw near the **back** center controls the volume delivered to the **front** center and vice versa.

Controlling Small Areas

Should it be necessary to increase the volume delivered over a narrow area of the sheet not controllable by the adjustment of the slice, place an obstruction opposite this area, a short distance behind the slice.

This will form a small dam opposing the flow. The volume will therefore rush round the sides of the obstruction, thus delivering a slightly faster flow at the point desired.

The flow can be reduced at any given point by hanging a piece of apron cloth over the inside of the slice, allowing it to project round the slice edge.

The patent slices, mechanically adjustable over small areas of the deckle width, eliminate these rule of thumb methods and, properly used, are a boon to papermakers.

Using Two Slices

The principles governing the use of two slices, is a recognition of the vital necessity to use a sufficient volume of water to **float** the fibers thoroughly in suspension, even when the flow weight of such a volume would be greater than the speed at which the machine is to be run. In other words, the use of two slices is simply to enable the use of volume and yet restrict the flow weight of the suspending volume to the speed of the machine.

The usual position is to have the back slice set over the center of the breast roll and the front slice set over the center of the first tube roll.

The distance of the edges of the slices from the apron should be in the proportion of two to one, the

back slice being kept twice as high as the front slice.

We therefore have two volumes of water and stock and their speed by flow weight to consider.

The area in the head box behind the back slice is many times greater than the area between the two slices, and the volume occupying this greater area is used primarily as a suspending and density reducing medium.

The smaller area between the two slices therefore assumes control of the flow weight speed. It being obvious that the reduction in volume means a ratio reduction in delivery speed.

It must be remembered, however, that the wire flow, when using two slices, is on an unrestricted horizontal plane right back into the head box, and unless checked by the proper use of aprons must receive the impetus of the greater volume behind the back slice.

The speed of the machine is limited to the flow weight of the volume impounded by the area between the two slices, and any increase of speed above this is disastrous to formation.

Deliver the STOCK in suspension at a speed slightly faster than the speed of the wire, so that when the fiber ceases to be held in suspension and becomes a sheet of paper, it shall conform evenly across its width, to the speed of the wire without a displacement of the formation of the fibers.

Relationship Between Raw Stock and Coated Paper

By NORMAN CLARK

IT IS now generally recognized that the more we know about the materials entering into our manufacturing processes, the nearer we are to a position of perfect control. This is being carried out in many industries where the number of raw materials is large, as in the steel works. In the process of coating paper we deal principally with two materials, paper and color, the word color here meaning the tint or coating mix. Of these materials, there seems to be less information concerning the paper than the coating mix, notwithstanding the fact that when the paper arrives at the coating mill it cannot be changed. On the other hand, the coating or color mix can be varied almost at will in many of its properties.

But, you may ask, is this knowledge of raw stock important? It is, and of as much importance as the color. The coating operation utilizes two factors, namely, what we are coating with and what we are coating on, and the surface upon which we are putting the color is worthy of as much consideration as the color itself. The two reasons for this are concerned, first, with the way in which the color will brush and lie on the sheet, finish being dependent on the character of the raw stock; and second, with the efficacy of the coated sheet for the purpose for which it is intended, this depending as much on the stock as on the color.

Co-Operation

Between the coating mill and the papermaker, there is a good deal of indulgence in the favorite sport of "passing the buck." One says the other does not know how to make paper, which brings the retort that the other knows less about coating. Where such a condition exists, progress toward a solution of this problem goes backward. What should take place is this—let the coating man and the papermaker get together and put their cards face up on the table. It is surely to the advantage of both parties to solve this matter and they would do well to pool their information and lay out a plan of campaign. Suppose the coating mill is interested in a sheet of litho. In such a case, the coating man should seek an interview with the printer and come to the meeting fortified with data on the behavior of the paper in the press room, such as how it conditioned, action on the plates and ink, the register, etc., and thus reinforced with information as to the running in the coating mill, he would be ready to talk intelligently. Then, assuming the papermaker knows his game, it should not be very difficult for them to decide on a sheet that will meet the conditions required.

Knowledge for Coater

There are five groups of data necessary for the coating man to know if he is to do his job intelligently. First, he must know the character of the sheet that will enable him to turn out the best work. There are many mills where the boss coater knows more about coating than he is given credit for, because he is not supplied with the right paper to do the job. The mill itself does not do itself justice in having to put on the market a coated sheet that is really not A 1, whereas they could command a higher price for the excellence of their product by using a sheet that was better adapted both for their color and for the purpose intended.

The coated paper manufacturer must also be able to tell if the paper accords with his specifications. Did he get what he ordered? This means testing,

at least to the extent of determining if his specifications have been met. The papermaker may have intended giving him the sheet decided upon, but very often there is a slip.

The coater must be able to test and correlate all necessary data on an unspecified sheet so as to have definite facts to lay before the papermaker. The papermaker is no more a coater than the coating man is a papermaker, but they have plenty of common ground for meeting, so if they would quit slinging mud at each other and get together, as suggested, much might be accomplished.

Fourth among the groups of data must be included a knowledge of the requirements of the finished sheet when put to the use intended. If for printing, is it for flat bed, cylinder-press work or a lithographic process; or is the sheet to be used for box covers, labels, playing cards, blotters, dial, or some specialty? Whatever the use, it will have pretty definite requirements and you will find that the raw stock contributes largely to the meeting of these.

The fifth and final requirement for a coater who is to do his work intelligently is an ability to translate troubles in the coating operation, or in the utilization of the sheet, into facts relating to the qualities of raw stock.

General Properties Desirable

Let us examine together the qualities that are desirable in most coating sheets. Of course, it is understood that for specialties these may be entirely different according to the requirement of the case. Again, these observations are based on my own experience and undoubtedly there are those who will disagree with me. But at least let them be the basis for further thought.

Formation.—It may be said that all coating raw stock should be as uniformly closed up as is possible under the conditions of the prescribed furnish. A wild sheet is not a good coating sheet, because of uneven absorption of the color. If this sheet is to be used in printing, it will absorb the ink unevenly and turn out inferior work. Again, if for a box job, a wild sheet presents a disagreeably mottled appearance, especially if finished at all high on the friction or stock. So we ought to have a closed-up sheet.

Dirt.—Dirt is always objectionable and this includes shives, rosin and lime spots, and specks of all kinds, whether aniline dye or just dirt. Whatever the character of the spot, it should not be present. The coating covers a great deal, but not all, and spots show through or cause a local thickening or thinning of the coat. The finishing operation usually tends to make these spots more noticeable, so that once in the sheet that sheet should be rejected for fine work. This matter of cleanliness is imperative in paper intended for Litho, Dial, Light Enamels, Proving Plate, or Translucent. Shive should be looked after pretty carefully in groundwood sheets, especially where dyestuffs are used, because of the affinity of groundwood for many dyes. If much be present, a mottled appearance will result.

Color.—For whites, tints and bright colors the sheet should be a clear, snappy white. The better the color of raw stock, the clearer will be the coating. For other shades, the nearer the color of the raw stock comes to that desired in the finished paper the better, for under such conditions streaky coating, brush marks, and poor spreading of the color mix are not nearly so noticeable as when there are marked color differences between the paper and the coating applied. Some manufacturers have a preference for one tint of white, and some for another, but whatever the preference, care should be taken to see that shipments are uniform. If ordinary uniformity is difficult, provision should be made for dividing the shipment into at least two tints, a green or blue and a red or yellow.

Slack Edges.—In practically every operation in the coating paper mill, it is essential that there be uniform tension. To insure this, there must be no slack edges in the raw stock. Such a condition is productive of much waste owing to breaks and cuts. And not only in the coating mill but in the print and litho shops; for slack edges mean cuts, waste in feed and lack of register. Slack edges can be eliminated, and if the coating man insists on a roll of uniform tension, he will get it.

Thickness.—For a uniform coat we must have raw stock of uniform thickness. Variation is more apt to happen on a heavier than a lighter sheet. If one edge of the sheet is thinner than the other, it will take on more color and a difference in thickness of the sheet, edge to edge, will result. Mr. Printer then registers a kick because he cannot get a uniform impression with your paper edge to edge. So we must insist on an even gage.

Fuzz.—Fuzz or "whiskers" is a bad proposition all along the line. To the coater, it means local coloring of brushed-up fibers, or difficulty in getting the finish desired. To the printer, it is an endless source of trouble in filling up plates, smearing the ink and in coming off from the plates onto other sheets. Fuzz then is ruled out.

Finish.—Finish is something that is dependent both on the result desired and the nature of the color mix used. In general the highly finished sheet is not desired. A certain amount of finish is desirable to even off the surface of the sheet and that is about all, except for a few special lines. It is of extreme importance, however, that the sheet carry a uniform finish, edge to edge, to insure uniform brushing on of the color.

Curling.—Trouble from curling of the paper is practically impossible to locate before it actually happens in the mill. The coater gets it on one edge of the paper going down the drying line. The printer

runs against it when the paper is stacked up ready to run on the press.

Furnish.—It is difficult to talk about the furnish in general because the furnish ought to meet the demands of the particular run. Coating papers will run from 100 per cent groundwood through 100 per cent sulphite to 100 per cent rag. And for certain purposes each is right. But as to the general run of coated paper a few remarks may be made. If I were to preach a sermon on the subject my text would be "soda." A little soda taketh away much trouble with the sheet. Why do not coating men insist on it—merely the matter of a few cents and their troubles would be lessened immeasurably. There is one coating manufacturer I know who has a well deserved reputation for a superior coated paper, but I believe it comes not so much from his color and method of coating as from his raw stock. His stock contains as much as 40 per cent soda. Here are some of the things soda will give you—(1) good, close, even formation; (2) clean sheet; (3) good color; (4) good absorption for color; (5) good bulk; (6) pliability. These are all properties you are looking for, so insist on soda being present. Do not any longer take that hard, tinny, all-sulphite sheet that they have been handing you for book work.

Size.—Size should be just hard enough but not too hard. That's not very definite, I know, but the sizing of the sheet must meet the demands of the furnish, the coating operation and the particular use for which the paper is made. I might say here that starch size tends to prevent dusting.

Feel.—"Feel" as a name for property of paper is very indefinite as conveying a meaning to anyone else, but it is very real to yourself. Our language simply does not cover the case in point. About the best that can be said is that it should be velvety or leathery in feel. The paper should not be harsh or brittle when crumbled, of good bulk, and for box work especially, it should be very pliable.

Table

For guidance, I include a table showing under the various grades of paper some of the properties that may be numerically expressed. There may be disagreement over the actual figures, depending on the usage in the various mills.

Note—The sizing was determined by the cell-method, using 100 ohms resistance. The following values were taken:

Soft—Up to one minute.
Medium—One minute to three.
Hard—About three minutes.

Litho Plants

Now let us glance at some of the requirements of two or three industries. First the Lithographic trade. What has been said about formation, thickness, curling and slack edges holds most strongly here. In addition, the sheet should bulk well to give

TABLE OF PAPER PROPERTIES

Grade—	Ream Size	Weight	Fiber Per Cent				Bursting Strength	Sizing	Uses
			Sulphite	Soda	Ground Wood	Rag			
Friction and Flint	20x24	17	30 70	... 30	70 ...	... ...	10-15	Medium	Box covers
Plate	20x24	17- 50	70	30	...	...	12-35	Soft	Labels, box covers, kindergarten supplies, posters
Book	25x38	40- 80	60	40	...	...	10-20	Soft	Printed matter
Dial	22x28	70-160	80	20	...	...	50-80	Hard	Clock and watch dials
Playing Card	22x28	45-115	70	30	...	...	20-50	Hard	Playing cards
Litho	25x38	35- 90	70	20	...	10	15-40	Hard	Lithographic work
Box Board	.....	0.01-0.03	Liner, Long Manila, Middle, Short, Softer				40-70	Medium	Light boxes
Enamel	25x38	35-125	70	30	...	...	15-60	Medium	Box covers, illustrations
Translucent	25x38	110-150	70	15	...	15	50-70	Medium	Embossed work, lithography
Proving Plate	22x28	50- 80	70 45	30 75	... ...	... 40	15-30	Medium	Lithography
Tablet	22x28	50-120	Long Fiber Manila				30-70	Medium	Pads
Label	20x24	17- 50	50	...	50	...	10-20	Hard	Printed labels
Enamel Blotting	22x28	90-180	...	...	...	100	....	Hard (one side)	Printed blotters
Metallics	20x24	12- 50	Glassine, Manila Greaseproof, G. W. or Free				....	Medium	Fancy box covers, packages
Micas	20x24	20- 28	High Soda to Give Bulky Sheet				....	Soft	Fancy box covers
Waterproof	20x24	20- 35	100 45 35	 15	... 55 25	 25	10-30	Hard	Box and notebook covers, many specialties as suitcase, etc.

a slightly yielding surface, as this takes a much better impression and is not so hard on the plates as a hard, tinny surface. I wonder how many of you papermakers and coating men know anything of the disastrous effects of certain chemicals on the efficient running of paper through the litho presses. Chlorine, alum and free acid if present in appreciable amounts will tend to eat away the lines on the plate and act adversely on the ink. Alkali will sensitize the plate to grease and tarnish the bronze ink. Sulphur will form H_2S and tarnish the bronze ink.

There are many ways possible in which one or more of these chemicals may be present, but certain it is that the paper must be neutral in all these respects if the pressman is going to get the best results with your paper. It means, for example, that you should not use a satin white coating that is not strictly neutral. To do so would be to run the risk of offsetting any care the papermaker may have taken in making your sheet.

Box Plants

In the box trade, they want a sheet that is sized sufficiently but not too much. That is definite, is it not? Well that is about the way they are. Here is the point: The sheet needs to be hard enough so that the moisture of the paste, used in gluing the paper to the box, will not soak through too much and render the paper difficult to handle. On the other hand, it must not be too hard or it will not be pliable. It should readily take the form of the box and when put should stay put and not spring off. The formation of the sheet must be even and it should be well closed up, so as not to show wild on being finished.

For book work an even closed formation, with uniform thickness, is very necessary to ensure a consistent impression. Care must be taken, however, that the sheet does not bulk too much, else books and magazines would become unwieldy.

Suitcase

In the case of the specialties, there are distinctive requirements for each process. Suitcase stock must be hard, have a close formation, low bulk and not be brittle. The reasons for these requirements are that the color must go on the sheet very evenly, stay on the surface and not crack when folded for edges and corners of cases.

Absorption Papers

Just about opposite are the papers used in absorption processes. Here, where the color mix is absorbed into the body of the stock, a sheet of low or no size, of high bulk, very short fiber, and fuzz as low as possible is needed. If there is much fuzz, it will adhere to blade or roll, and collecting the mix will come off in gobs of material.

Metallics

Again, metal papers require a paper that is different. They should be very hard sized so that all the metal will remain on the surface.

Storing of Raw

Before I close, just a word about storing raw stock in the coating mill. So many times a coating man is pressed for room and will store raw stock somewhere in the hot lines. Anything worse for the paper could hardly be imagined. It deteriorates the stock rapidly, especially if it contains any groundwood. Again, if the roll is put right on the machine it will absorb an undue amount of water and the chances are it will buckle the sheet or cause a separation of the color as if it were too thin.

Color

I cannot resist saying just a word about color. Be sure to run the color in the color pans as heavy as you can and still spread and brush out evenly. The best way is to take hydrometer readings on each tub of color sent out. While this does not give the absolute specific gravity, it at least gives a result that is comparative for the same grade of color.

In closing may I reiterate my plea about the papermaker and coating man getting together. There is nothing you can do in the plant that will pay you such high returns as this. Frankly approach the man with whom you are dealing and the chances are his "come back" will be as open and eager as yours. In dealing with paper mills or coating plants let your slogan be **Co-operation.**

Steam and Brains

Steam, to function as steam, must be under pressure. Until then it is only vapor.

Brains, too, must be under pressure before they can do their best work.

Loose steam will no more drive a piston than loose thinking will drive a job.

Compression is a law of the universe. It started the planets whirling through space, it drives the tides, densifies the air so that we can breathe it—keeps the very cells of our body together.

Without brain compression we couldn't keep our thoughts in a straight line. They would fly off every which-way. With compression we can marshal our wits, make them aims, and in turn, achievement.

Without pressure, the finest engine would be worthless. It would be everlastingly at rest—and rest is rust.

Without pressure, the finest mind would soon become lazy, unproductive, useless.

A loose rubber band holds no papers.

Busy men who retire to the "easy life" soon die. (See the statistics.)

Constant high pressure may make the boiler grumble a bit and a safety valve give warning, but only a weak head—cylinder or human—flies off under it.

Pressure put to work, is a good thing; it never

did an engine or a mind a bit of harm. Used in the form of energy it keeps the engine going and away from the scrap heap.

Without pressure true genius would be unknown. For genius, or initiative, or accomplishment is only mental pressure properly applied.

Interesting Pulp and Paper Laboratories of Europe

III—Grenoble, France—The French School of Papermaking

By LOUIS E. WISE, PH.D.
Professor of Forest Chemistry, in the New York State College of Forestry, at Syracuse University

AN EARLY morning taxi, perilously driven to the Gare de Lyon, imposing terminal station of the P. L. and M. railway, helps me to escape steaming Paris, before the crowds have poured into the boulevards. Unfortunately, I am headed south. Even in the morning hours, the second class compartment of the "rapide" becomes a sooty inferno. Flat, sunparched landscapes rush past us. Dusty villages, glaring, gleaming white roads, drooping truck farms accentuate the heat. At Dijon, we have a brief respite; then on again to Lyons, where, late in the afternoon, covered with coal dust and grimy perspiration, we change trains for Grenoble. No need of describing the slow tedious trip to the old capital of Dauphiny in the express. French irony, no doubt, for this "express" covers 76 miles in 3 hours, and stops at every village and hamlet. Better to mention the grand finale: A blessed evening breeze blowing over ever-changing countrysides and an enormous, orange full-moon rising above the luminous French Alps.

Port of the Alps

Next morning, I am up at sunrise to explore the town, famous as the "port of the Alps," the most beautifully located city of France. Every street into which I turn appears mountain-locked. The town is literally encircled and barricaded by mountains.

I walk north, to the banks of the winding Isére, rising above which, on the heights are the great forts of the Bastille and Rabot—a soul-stirring sight in the morning sunlight. I make a hasty pilgrimage to the Palais de Justice, reminder of Charles VIII, and the Jardin de Ville, which faces the City Hall, formerly a mansion belonging to the Constable de Lesdiguieres. Then, a hurried breakfast in a lovely little patisserie, and I seek the real object of the Dauphiny expedition—the office of Dr. Louis Barbillion, director of the Polytechnic Institute of the University of Grenoble, and of the world-famous French School of Papermaking.

Grenoble, Alpine city of the French School of Papermaking

A well-known man at Grenoble is this M. Barbillion; known alike to industrialists and to men of

science; known to the concierge at the hotel; known to the sergeant-de-ville who directs me to his office in the Rue General Marchand. A busy man is M. Barbillion, a famous engineer, a prolific author of technical books, now steeped in the details and complexities of administering one of the greatest engineering schools in France. He gives me a hearty but hasty welcome, smiling at me through two pairs of spectacles. Then, after a few well-directed questions, he pulls bulletins and pamphlets out of his files, thrusts them into my brief-case, promises me a series of photographs, telephones to the School of Papermaking that I am to be taken through, shakes me cordially by the hand, and—ushers me out of the office. It is all done in a trice. The director's time is exceedingly valuable, for on the shoulders of Barbillion fall some of the gravest administrative responsibilities of the University of Grenoble.

I walk out hurriedly in the glare of a fiery morning sun, to the Rue Genéral Motte, on which stands the Institut Polytechnique. At one of the gates I am greeted by a clean-shaven, smiling, handsome young Frenchman, who informs me that his name is Aribert, that he is Professor of Papermaking at the Polytechnique, and that he is ready to "show me the works." After my very brief interview with Director Barbillion, I am a bit wary, and ask M. Aribert (in my uncertain French) whether I am not trespassing on his time. When he informs me that he is free for the day, and that his time is entirely at my disposal, I heave a sigh of relief and settle down to a pleasant day, under the friendly tutelage of this most delightful colleague.

The French School of Papermaking

To give the reader some idea of the development of the French School of Papermaking **(L'Ecole Francaise de Papeterie)** at Grenoble, we must begin at the beginning. The school was founded and organized within the surprisingly short span of 10 weeks, in 1907. It came as the result of a co-operative effort of the French Papermakers Association **(l'Union des Fabricants de Papier)** and the University of Grenoble—always with the directing genius of Barbillion in the foreground. The object was primarily to give a technical training for young engineers, who would enter the pulp and paper industry directly after graduation. The idea was also to provide a more elementary course for men who could later qualify as mill foremen or superintendents. Two years later, the opening of the research laboratory with excellent semi-commercial equipment permitted the study of new and untried raw materials for the pulp and paper industry. During the past 15 years, some 400 new fibers—some of them from French Colonial possessions; from Indo-China and Madagascar; some from Europe—have been studied in the Grenoble laboratory. Of these, sixty or more have yielded good paper pulp.

A large share of the money required for the equipment of the laboratories of the school of papermaking has been supplied by French industrialists, who had the good sense to realize that a technical institute would prove of immense benefit to their mills individually and collectively. The Union of French Papermakers keeps a strict supervision of the school, which since 1922 has been recognized as an integral part of the French educational system by the ministry of Public Instruction at Paris, the final arbiter regarding the status of educational institutions of

Courtesy of Mr. L. Barbillion

The Polytechnical Institute of the University of Grenoble, which houses the famous French School of Papermaking

France. This recognition assures the student and the industry that the courses are deemed technically adequate and have the official sanction of the gentlemen holding portfolios in Paris.

A fact that I found most interesting, as explained to me by M. Aribert, was that the school and the laboratory were on the eve of an enormous expansion to the tune of one million, three hundred thousand francs—an expansion which would involve the purchase and installation of new semi-commercial and scientific equipment and which would probably make the Ecole de Papeterie the leading institution of its kind in Europe, if not in the world.

The expansion is made possible by the industrialists of France, and seems the more remarkable when we consider that the French industries (now running full tilt) are really in a precarious financial condition and are certainly not blind to their future hazards. This levy of over a million francs for educational and research work indicates the confidence of the paper men in their foster child at Grenoble.

Vocational and Engineering Courses

As I have indicated above, the Ecole de Papeterie is an engineering school pointing directly towards a basic industry. Since the vocational (elementary) course is not as yet functioning smoothly and has not been fully developed, I shall omit it from my discussion further than to say that an intensive one-year course has been outlined for ambitious practical men possessing a good elementary school education, who have had at least one year of practical experience in the paper and pulp industry, and who have ambitions of becoming future foremen and superintendents in French mills.

In the engineering course, students who are 16 years old, or older, and who have passed successfully

a searching entrance examination in mathematics (through plane trigonometry), elementary physics and chemistry, are eligible candidates. The work is offered in a two-year course which if successfully completed, with an average of over 75 per cent, leads to the diploma of **Ingenieur-papetier** (Engineer in Papermaking). Students who complete the two years' course with a lower average, but with passing grades, receive a certificate indicating that they have attended the papermaking school. Graduates of engineering schools of recognized standing, other than that at Grenoble, may be admitted directly into the second year of the school. This is also true of the graduates of other colleges, who have specialized in the physical sciences **(licenciés ès sciences)**. The latter, however, must pass examinations covering the subjects of the first year at Grenoble. Further than this, men who enter with such advanced standing must have completed a certain amount of practical work in the industry. In fact all men taking the course in papermaking are required to spend a minimum period in a paper mill prior to their graduation.

American Students Admitted

I was glad to learn from Professor Aribert that American graduates, who had a good knowledge of French and could follow the lectures without difficulty, were admitted on a par with graduates of French institutions.

Curriculum Demands Intense Study

The two years at the school involve a curriculum, which to an American teacher appears terrific in its intensity and in its discipline. It is not surprising that the matriculating student is warned that university requirements will prevent him from doing any outside work, and that he must give his entire time to his studies. Absences from class room or laboratory, except in rare and exceptional cases, are not tolerated. Refractory or boisterous students are reprimanded, and then, if their offenses continue, summarily dismissed without reimbursement of fees. Thus, we have an atmosphere of hard, gruelling work, concentrated into the shortest possible space of time. The student is headed towards a definite goal. No distractions are permitted. The school year opens early in November. It lasts until the end of July. During that time, the student is kept with his nose to the grindstone.

So that the reader can draw his own conclusions regarding the value of the papermaking course, I have thought it best to give a brief outline of the course of study. The first year is general in nature and includes only fundamental courses, not courses in papermaking. The following work is given:

I—MATHEMATICS.
1. Brief review of trigonometry.
2. Analytical geometry.
3. Advanced algebra.
4. Calculus.
5. Theoretical mechanics (kinematics and dynamics).

II—PURE PHYSICS.
1. Mechanics.
2. Gases and Liquids.
3. Heat.
4. Sound.
5. Light.
6. Magnetism.
7. Electricity.

III—CHEMISTRY.
1. General chemistry (fundamental laws; properties of metals and non-metals).
2. Elementary organic chemistry.
3. Qualitative analysis.
4. Quantitative analysis (volumetric analysis and gas analysis).

IV—MECHANICAL DRAWING.

V—INDUSTRIAL MECHANICS.
1. Applied hydraulics.
2. Strength of Materials.
3. Traction engines.
4. Industrial thermodynamics (boilers, steam engines, turbines, gas engines, etc.).
5. Elementary technology (machine-shop, forge and foundry practice, etc.).

VI—INDUSTRIAL PHYSICS.
1. Various physical measurements.
2. Technical dynamometry.
3. Applied manometry.
4. Pyrometry.
5. Calorimetry (calorific values of different fuels).
6. Theoretical thermodynamics.
7. Industrial mechanics.
7. Gas compressors (liquefaction of gases).
9. Gas production (gas-lighting).
10. Photometry.

The student who survives this first year is then permitted to enter the specialized work of the second year, which comprises briefly of the following:

I—A course on the manufacture of paper and paper testing, including semi-commercial experiments and laboratory work.

II—A course in the chemistry of papermaking materials, together with laboratory work.

III—A course in "micrography" (microscopic) as applied to the art of papermaking, together with intensive laboratory practice.

IV—A course in advanced mechanical drawing (machine design, directly applied to the pulp and paper industry).

V—A course in electrical engineering with practical work in the electrical laboratory.

VI—A course in industrial and commercial law (business law).

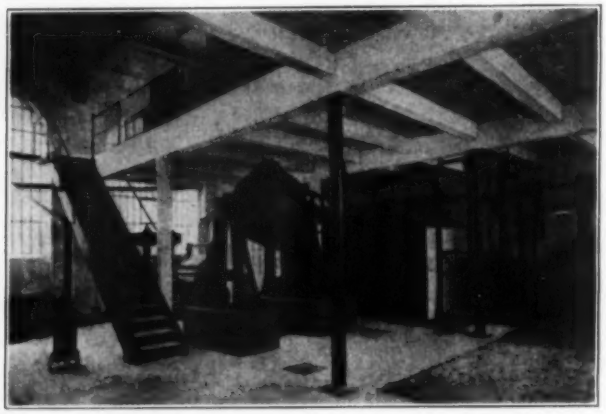
VII—A course of special lecture topics, including plant design and construction, mill management, finance and accident prevention in the pulp and paper industry.

Some Details of the Courses

At the risk of boring the reader, I would like to discuss in somewhat more detail, several of these courses. The fundamental lecture course in papermaking concentrates, or so it appears to me, on the manufacture of rag papers. The use of papermill machinery, operation, etc., are taught in detail primarily from this angle. The equipment found at Grenoble is also of the type which permits of such instruction. I do not want to give the impression that wood pulp is neglected; far from it—but rags, their selection, characteristics, treatment and utilization appear to receive primary attention. Another point which may be of interest is that there is no separate and distinct course in paper and pulp

mill machinery. The use, design and construction of paper mill equipment is incorporated directly into the fundamental course (I, listed above) or left to special conference topics (VII, above). The lectures in course I also take up the manufacture of mechanical and chemical wood pulp—which our French friends persist in calling cellulose—straw, esparto, ramie pulp and papers made from such pulp, the deinking and uses of waste paper, the merits and limitations of the different papermaking fibers, etc.

This same course also gives in detail the raw materials entering the industry, and methods of testing them, the problems connected with the use of water



Courtesy of Prof. Aribert

The semi-commercial spherical digester used in making soda cooks at the French School of Papermaking—familiarly known as "Lessiveur"

in the paper industry, power problems, problems regarding site, location of mills, etc., etc. Finally the lectures also outline physical, chemical and microscopic properties of paper and the various tests used in studying these properties.

The reader must remember that the work described above is included in a lecture course, but that synchronized with this work there are a series of comprehensive laboratory courses. The student actually carries out experiments in papermaking, from raw materials to finished products, either in a miniature "baby-mill" or with the excellent semi-commercial equipment with which the school is provided. He not only learns the principles of paper testing, but carries them out in the laboratory, which is excellently equipped for this purpose, with the single weakness of being deficient in humidifying equipment, which would insure constant moisture conditions.

The course in the chemistry of materials used in papermaking also deserves a word of comment. It takes up in some detail the chemistry of cellulose, its properties and its derivatives. The manufacture and properties of the following chemicals are also thoroughly discussed: Soda, sodium sulphate, sodium, calcium and magnesium bisulphites, chlorine, bleaching powder, "antichlors," alums (and especially papermakers' alum), calcium sulphate, kaolin, barium sulphate, hard and soft waters, organic coloring matters and pigments used in papermaking, sizing materials (including rosin, rosin soaps, starch, gelatine and casein). Here again, the lecture work is supplemented by work in a beautifully equipped, beautifully lighted, tiled laboratory, which Professor Aribert showed me with some pride, and which can easily house 60 students at a time.

The work in micrography and microscopy is given by Professor L. Vidal, whom it was not my good fortune to meet, who is senior professor at the School of Papermaking, and who has gained an international reputation in the field of micro chemistry and microscopy as applied to papermaking.

M. Vidal takes up first of all, the principles of vegetable lustology. He outlines the structure and the function of vegetable cells, discusses the different botanical elements, and points out modifications and changes that take place in plant tissues during growth, like lignification, cork-formation, etc. He then gives instruction in the use of the microscope, the preparation of slides, and the principles of microtechnique. Thereupon, the student is initiated into the microscopy of textiles and papermaking fibers. Under the microscope, he studies the properties of cotton, linen, ramie, jute, wool, etc., the characteristics of fibers obtained from rice, corn, esparto, hemp, bamboo, etc., and finally the microscopic features of such papermaking woods as spruce, pine, poplar, magnolia, etc. Subsequently, the student takes up the qualitative microanlysis of paper, followed by quantitative microanalysis. M. Aribert assured me that his colleague gave a "thorough course," but such assurance was hardly necessary.

I shall not try the reader's patience further by giving details of the courses in law, in machine design, or in electrical engineering.

Individual Exercise Instead of Thesis

I asked M. Aribert whether the school required a thesis or the completion of a problem in pulp and papermaking. He answered that up to the present, no thesis had been required, but that the faculty now had the matter under serious consideration. However, added M. Aribert, each student had an individual exercise to complete in connection with his course. The professor would tell him to "construct" a mill turning out a certain number of tons per diem of a certain kind of paper. The student then had to draw up detailed plans for such a mill, discuss the cost of construction, operation, equipment, raw materials, management, etc., thus correlating all that he had been taught in his various courses during the second year.

Eleven Out of Forty Receive Diploma

A number of other queries flashed into my mind. How many students were enrolled in the School of Papermaking? M. Aribert smiles. The first year

men, in 1925, he said, numbered about 40, but the mortality among these students was high. At the end of the first year, about 15 of them had either flunked outright or else decided that "papermaking was not their life-work." In other words, about 25 men started specialized work in the second year. Of these, only three had received the diploma of **Ingenieur-Papetier** at the end of the semester. Subsequently, eight more had passed examinations that entitled them to the **I-P.** The rest would receive Certificates of Attendance. Consequently, only about 25 per cent of the entering group graduate as engineers.

Records of Graduates

Another question: Are many foreigners taking the course? Yes, said M. Aribert, 40 per cent were foreign students. He once had an American (U. S. A.) who would have received the coveted I-P but for the illness of his father. Two Canadians had taken the course and received their full credentials.

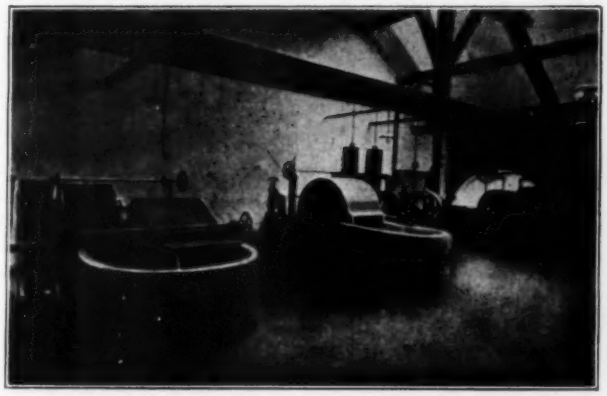
What of the men who graduate? M. Aribert silently passes me a commemorative booklet and then apologizes. The booklet contains some excellent reproductions of the equipment at Grenoble, but it also gives a list of the graduates and what has become of them. Eighteen of the students or graduates, among these young papermakers have died for France! Forty of them have been wounded! Many of them have been cited for bravery. The record requires no comment. Of the remainder, and of those who have recovered, many are technical men in the pulp and paper industry. Each year one or two of the best students remain at the school as demonstrators or assistants (**préparateurs,**" as they are known). Such men, besides helping members of the faculty, are also able to enter some field of technical research connected with the industry. However, the additional year in residence does not entitle them to a higher diploma.

The smiling Aribert, in his office, across the dinner table, or in the café which we frequent in the late afternoon, keeps answering my questions with patience and urbanity.

Research Activities

What of the research work of the school? Hundreds of vegetable fibers have been tested as possible raw materials for papermaking. Each investigation is in itself a piece of research. Any number of routine tests have been made for the industries; any number of queries have been satisfied by the staff.

The type of investigative work that is undertaken at Grenoble is well illustrated by two articles, of which M. Aribert was good enough to give me reprints. Both of them are very recent, published in 1926 through the National Institute of Colonial Agronomy (**L'Institut National d'Agronomie Coloniale**). Of these the more recent one is by Messrs. Vidal and Aribert, who have co-operated with and supplemented the work of the French Colonial Institute of Agronomy, and the Director of the Laboratories of the Navarre paper mills. It takes up the possible utilization of the wood of the "parasolier," known as the umbrella tree, in the manufacture of paper. This tree abounds in Central Africa, and has often interested paper technologists of European countries that have colonial possessions in the tropics. A number of articles on the use of the wood (**Musanga Smithii,** R. Br., also known as **Combo-Combo**) have previously appeared in foreign journals. The new French monograph on the subject is admirable in the detailed directions given by the authors for the utilization of parasolier wood, and



Courtesy of Prof. Aribert

"Salle des Piles" (beater room with small bleacher and semi-commercial beaters) at Grenoble School of Papermaking

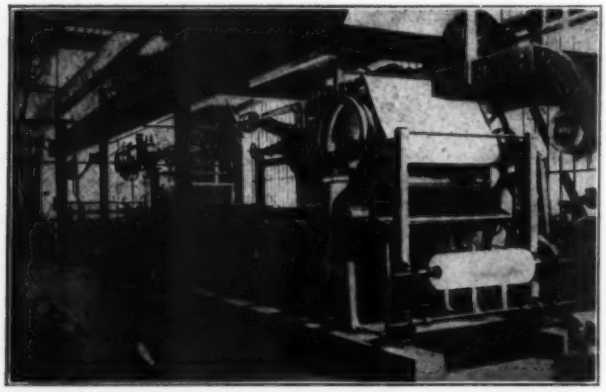
for recommendations given to interested technologists. Evidently mechanical pulping is unsatisfactory, but a carefully conducted soda cook yields a pulp that may be used without bleaching in wrapping papers (of poor quality) or which when bleached can be used in book papers. Such papers, however, are weak, as shown by the folding endurance tests, unless the pulp has been treated with 1 to 3 per cent latex, which seems to increase the strength quite materially. (Industrial experiments carried out by Mr. Thiriet, of the Navarre paper mills, showed that the sulphite process gives good yields, a better and stronger pulp with parasolier than does the soda process.)

Since the wood is unusually light and excessively bulky, shipment from Africa to distant points is out of the question. On the other hand, it is hardly feasible to erect mills for book paper in darkest Africa. Aribert and Vidal feel that the solution of the umbrella tree problem may be found in local (African) production of unbleached soda pulp which can then be shipped to French paper mills. Whether or not this is practical today is rather a question.

A feature of the monograph is that it is actually printed on paper made from parasolier wood. The first 32 pages of the article are made from pulp containing 70 per cent bleached parasolier pulp and 30 per cent of bleached spruce sulphite. The next 31

pages are made of a mixture of 75 per cent bleached parasolier pulp and 25 per cent of bleached sulphite. The cellulose of the final 10 pages contains only soda pulp made from the umbrella tree.

Vidal and Aribert naturally have given all their experimental data in excellent form, especially the



Courtesy of Prof. Aribert

The semi-commercial paper machine at the French School of Papermaking—a product of three manufacturers of Grenoble

details of their physical tests. The remainder of the article is devoted to chapters by botanists and technologists, and the climax is capped by a little epilogue, a personal comment by the printers of the monograph, saying that in their hands the paper made from the umbrella tree gave excellent satisfaction! High praise, indeed!

I shall not spend more than a moment with the other article, also published in 1926 by Vidal and Aribert. This concerns a study of the Water Hyacinth **(Luc-Bink)**, which was recently introduced into Cochin-China, where it grew and multiplied so rapidly that it became a pest in the waterways and actually obstructed navigation! Could the French School of Papermaking use this "pest" in the manufacture of a satisfactory paper? Unfortunately, the answer is No. The plant gives a fair grade of wrapping paper, but the yields are nothing to boast of. Bleached pulp is difficult to obtain and is very poor in quality when it is obtained. This is indicated by the book paper used in Aribert and Vidal's reprint, which is printed on paper made from "Luc-Bink" itself. So their recommendation, after giving and analyzing all the experimental data, is that the establishment of pulp mills utilizing water hyacinth is hardly warranted.

I have tried to give an example or two of the manner in which the staff of the school at Grenoble do their work. They are frequently in co-operation with other agencies. Their work is thorough and painstaking, and their reports are extremely conservative. The equipment for this type of investigation is excellent, especially when it comes to papermaking, for the school still lacks an adequate semi-commercial sulphite digester. They have a good spherical soda digester, several very nice beaters, an adequate little bleaching system, good equipment for making rosin size, etc., and a beautiful semi-commercial paper machine—the joint product of three manufacturers of Grenoble.

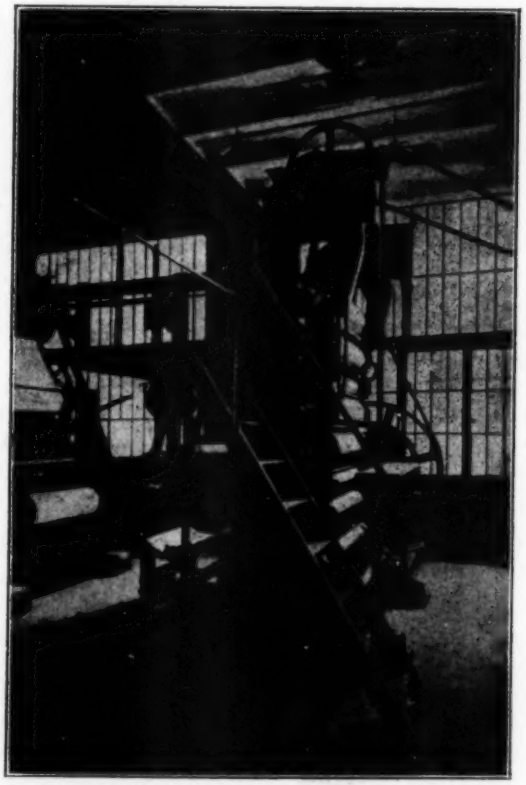
Professor Aribert's Invention

Before leaving the question of equipment, I want to add a word about one of M. Aribert's inventions, about which the inventor is all too modest.

While inspecting the pulp-making laboratory, I noticed a large electrically heated drying oven, with what appeared to be a balance pan "growing" out of the top. Mr. Aribert had shown me the entire equipment excepting this one piece, and he now explained that this was his "first model" of a pulp-drying oven, which was still undergoing evolution.

The interior of the oven contains a series of circular platforms, each with a circular hole in the center. These metal discs are so hung—one directly above the other—that they are some six to eight inches apart, and that they can be made to rotate by means of an externally controlled mechanical device.

Each platform is provided with a series of ten pairs of tracks, converging from the outer circumference



Courtesy of Prof. Aribert

Calender in the semi-commercial laboratory at Grenoble, which is on the eve of further expansion

towards the central circular space. Through the central opening, common to all of the platforms, and perpendicular to the platforms, hangs a tier of 5 skeletal

balance pans, one above the other, and each one on a level with one of the platforms.

By means of each pair of tracks, a rectangular aluminum container can be steered by a judicious push from without into one of the balance pans, whenever the platform has been so rotated that the tracks and the balance pan of that level are in proper alignment. The weighing is then made without opening the oven, for the weights are placed on the external balance pan, while the containers with their pulp samples are wholly within the oven. The outfit is so calibrated that it weighs with sufficient accuracy at 100° Centigrade (212° F.). After a weighing has been completed, the weighed container is mechanically removed back to its tracks, the platform is rotated until another set of tracks are in alignment with the balance pan, and the operation is repeated with another pulp container. Weighings can be made on any one of the five levels.

It is evident that the pulp samples can thus be heated and dried to constant weight without removing them from the oven. This is important since bone-dry pulp readily takes up moisture from the air as it cools, and the Aribert oven-balance overcomes this difficulty.

M. Aribert explained that the weights of the 50 aluminum basket-containers were identical, that each basket was clearly numbered, and that any number of the containers could be taken to a pulp mill, filled with moist pulp samples and weighed directly at the mill. They could then be sent back to the laboratory at the convenience of the analyst, and the moisture accurately determined by the use of the oven.

When a large number of samples had to be run, the drying was continued for several hours at 100° C. Then one basket container plus its charge on the uppermost level was weighed; and one container plus its charge on the nethermost level was weighed. After several hours these same baskets with their respective charges were reweighed. If no change in weight had taken place between these two sets of weighings, in the case of either basket, the operator assumed that all of the pulp samples were bone-dry and weighed them all systematically.

The device is very ingenious, and offers great possibilities for laboratories where frequent moisture determinations are required.

It was with difficulty next morning that I dragged myself away from Grenoble, its hills half hidden in shimmering, iridescent mist. An omnibus train, the slowest on earth, very gradually pulled me out of the station, lumbering ever so slowly past the great mountains of the "Grande Chartreuse" lost in banks of clouds; past the metallurgical plants of Domene; past the paper-mill town of Lancey;* past the chateau of Tencin; past the towers and ramparts of Montparsard; finally across the river Isère, with Mont Blanc entirely invisible in the distance; gradually, ever so gradually into the station at Chambéry, chief city of Savoy, flanked by glorious mountains and basking in the memories of its stormy and checkered career.

As I sat out in the open-air restaurant at Chambéry, awaiting the "rapide" to Paris, I saw in retrospect that superb school at Grenoble, with its splendid facilities, its energetic staff, and its far-sighted director, and felt that the industries of the republic had acted in accordance with the vision of their race, and had invested wisely and exceeding well.

*The village of Lancey is historically very interesting to the papermaker. It was here that the engineer Bergés, in 1869, erected a power plant, one of the first, if not the first to convert waterpower into electrical power. It utilized the waterfall above the village—nearly 1,600 feet in height. It was as a result of the Lancey installation that the significant name of "white coal" *("houille blanche"* as it is known in France) first came into being.

The Paper Industry Safety Contest

(Continued from Page 1485)

duly signed by the individual requesting such change and **countersigned** by an officer of the company.

7—All contestants shall make monthly reports to the Chicago office of the National Safety Council on forms furnished by them. These reports shall be in accordance with all rules listed and notes on reverse side of report.

8—Reports must be mailed so that they will reach headquarters office not later than the 15th day of the month following.

9—Any contestant 30 days or more in arrears with their monthly reports shall automatically be withdrawn from the contest.

10—Every mill entered in this contest will receive a key number, known only to that mill and one member of the headquarters staff, National Safety Council. Monthly rankings will be published on this basis. However, when the contest is over, the final ranking will be issued without key number, but with company name.

11—When the winner of each group has been definitely decided, the judges will award to one of these three, having in their opinion, established the best record based on accident frequency and severity, man-hours worked, physical conditions and any other contributing factor, the grand prize cup donated by THE PAPER INDUSTRY of Chicago.

12—Final award of all trophies will be made at the 16th Annual Safety Congress of the National Safety Council, to be held September 26 to 30, 1927, in the new Stevens Hotel, Chicago, Illinois.

13—The judges of this contest shall be:—

W. H. Cameron, Managing Director, National Safety Council, Chicago; Edward B. Fritz, Publisher, The Paper Industry of Chicago; E. W. Beck, Chairman, ASSE-Engineering Section, N. S. C.; E. F. Blank, Safety Director, Jones and Laughlin Steel Company, Pittsburgh, Pa.; G. E. Sanford, General Electric Co., Schenectady, N. Y.

14—All entrees in this contest must be received **on or before January 15, 1927.**

Where America Must Look for Its Future White Paper Supply

By B. T. McBAIN
Portland, Oregon

LET'S forget the World's Series and gridiron heroes long enough to have a concern about America's future paper supply.

United States statistics show that in 1925 the people of this country used an average of over 160 pounds of paper per capita. As time goes on, new uses for paper and paper products are being developed and from year to year this figure will be materially increased.

We are a nation of paper consumers.

Wood is the basic raw material of all grades manufactured.

Of course, the greatest consumption is through the daily press; the second largest demand comes from the weekly magazines and like publications, though for those grades some reclaimed stock is used. Wrappings, bags and containers for food are taking hundreds of thousands of tons of pulp each year. All of these require for their making large quantities of pulp wood, a large part of which comes from our neighbor to the north. Large quantities come into America in the form of sulphite, sulphate and ground wood pulps from the pulp-making countries of the old world.

One hundred and sixty pounds per capita and 110 millions of people means 8,800,000 tons of the various grades of paper, including light boards and container grades.

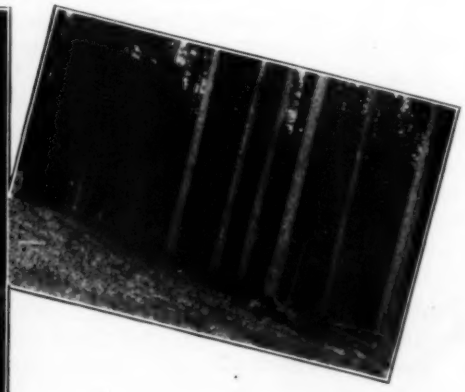
Civilization depends much upon paper. "The pen is mightier than the sword," but what value would the pen have without paper?

Very few of our people, comparatively speaking, have been favored with the opportunity to see paper manufactured, yet there are hundreds of paper mills and thousands of paper machines scattered throughout most of the 48 states of the Union.

All of these mills do not manufacture their own pulp, but many of them buy it either from American pulp mills still enjoying a supply of pulp wood, or import it from Canada or secure it in the form of pulp from the other foreign mills referred to.

Lake Merrill in Cowlitz County, Washington

Upper Kalama Falls, Washington. About 50 feet high



Timber in Cowlitz County, cruising 108,000 feet to the acre

There are few pulp mills in the eastern and middle western states that have ahead of them better than ten years' supply of pulp wood; more of them do not enjoy a future supply of over five years and there are many of them that do not own any pulp wood at all, buying from hand to mouth from day to day, much of their wood coming in from Canada.

Of the three million odd tons of newsprint paper now consumed by the American press, over half, probably three-fifths, comes from Canada and other foreign countries, while at the present time mills are being built in the various Canadian Provinces which will almost double the Canadian production of that grade during the coming year. When these mills are completed and producing, it is my firm though humble opinion that the Canadian Government will put some form of an embargo on the exportation of pulp wood. It is only natural that they should do this, thus protecting their own citizens and industries.

What will then happen to the mills of the eastern and middle western states now depending upon that

country for pulp wood is only conjecture, but in the absence of supplies of the various grades of pulp required there will be one natural result—discontinue operation in America and move across the line, or else search for new sources of pulp wood or pulp supply.

The United States Government has had this in mind for many years and the Department of Agriculture, through the Forestry Division, has investigated all the available pulp timber of the various states and territories, with the result that very interesting, authentic and instructive publications are available at this time for the asking.

Southeastern Alaska is one of the finest sources of virgin pulp wood supply left for American use, yet many people consider that territory so far away that they seldom even give it consideration, though its climate averages better than the state of New York both winter and summer.

This past summer it was my good fortune to spend some few days inspecting Alaskan timber and water powers. You will note I changed my reference from pulp wood to timber. There is no other timber in Alaska than pulp timber, practically 98 per cent of that growing on the various islands as well as on the thousands of miles of water front or inlets into the mainland being hemlock and spruce.

Over half of the available pulp wood remaining in the United States is on the Pacific Coast in the states of Oregon and Washington and in the territory of Alaska.

At the present time there are pulp and paper mills operating on the American Pacific coast manufacturing a total of about 600,000 tons per annum, while the consumption of the twelve so-called Pacific states with 12 to 15 million population is probably about one million tons annually.

The 1920 census showed them as follows:

Alaska	55,036
Arizona	334,162
California	3,426,861
Colorado	939,629
Idaho	431,866
Montana	548,889
Nevada	77,408
Oregon	783,389
Texas	4,663,228
Utah	449,396
Washington	1,356,621
Wyoming	194,402
	13,260,887

While some of these are not on the Pacific Coast, freight rates favor the Pacific manufacturers, hence their inclusion herein.

Had the Lake states and the New England states arranged 30 to 40 years ago to perpetuate their supply of pulp wood by reforestation and protective measures to prevent and fight fires, today there would be a young growing forest in the East and Middle West, sufficient to supply those mills soon to be starving for supplies and going out of business.

On the Pacific Coast, as Government reports show, there is now a sufficient amount of growing pulp wood not only to supply the present American production, but to ensure a continuance of that production, provided the growing of timber is not only encouraged by the various states, but insisted upon and assisted by the Federal Government, with the necessary tax relief and protection measures as to fire and other possible causes of loss.

However, in addition to the present available pulp wood, with the encouraged and protected regrowth, there is almost a perpetual supply of saw timber for lumber; besides, the waste from the present methods of logging and sawing lumber will supply in a large measure pulp wood for the various grades of paper consumed other than newsprint.

At the present time, the estimated annual cut of lumber of the Pacific northwest states of Oregon and Washington exceeds ten billion feet, that for 1924 being 6,267,343,000′ in Washington, 3,665,547,000′ in Oregon, making a total of 9,932,890,000′. The waste from this quantity of lumber amounts to at least 8,000,000 cords, including the tops of the large trees, the large limbs and the smaller trees torn down by the high line logging methods, as well as the slab waste in the operation of the sawmills, much of which later is sold as fuel wood.

Large quantities of this waste, about 2,000,000 cords, is left in the woods, and a considerable percentage of the rest is burned in the large waste burners attached to many western sawmills.

Five million cords of wood, the amount probably wasted, will produce 2,000,000 to 2,500,000 tons of chemical pulp per annum, not counting the use of the standing pulp timber available as such.

There is saw timber for hundreds of years if properly handled, even with this great waste, but why should the waste be allowed to continue when pulp wood is so badly needed in our sister states to perpetuate our industry?

Some pulp mills are already in operation on the Pacific Coast, using nothing but the waste from sawmills, and some paper mills are in operation as well as being built, but it is not only shameful, but almost criminal, that such wanton waste should be allowed to continue, while good timber is made into pulp.

West coast sulphite pulp is now being shipped to Wisconsin and to Atlantic ports, but the tonnage is so small as to not even amount to "a drop in a bucketful."

Eight million and eight hundred thousand tons in 1925 is a lot of paper, but each year we as a nation are using from 5 to 10 per cent more. Where will it all end unless some steps, and strong measured ones, are taken soon not only to perpetuate our pulp timber

supply, but to stop this enormous waste of our national natural resources?

Future generations will have their matinee idols and their sport champions of all kinds, but unless we today think of the generations to come and plant the seeds physically, politically and practically there will be no forests, no lumber, no paper, and without paper no civilization.

Fire Losses in Pulp and Paper Mills

By W. E. MALLALIEU
General Manager, The National Board of Fire Underwriters

DURING a recent three-year period, 132 fires occurred in paper and pulp mill properties, according to the records of The National Board of Fire Underwriters. The classification includes also leather board and strawboard plants because their hazards are considered to be on a par with those incident to the manufacture of pulp and paper, and, of course, in some mills all four materials are utilized.

The largest loss from an originating cause was that due to "Sparks from Machinery." "Spontaneous Combustion" was the next in importance, and "Lightning" came third, while Stoves, Furnaces and other parts of the heating plant stood fourth.

In an analysis of 402 paper mill fires made by the National Fire Protection Association, it was found that 195 were due to common causes such as the heating plant, lightning, spontaneous ignition and matches—smoking, while 122 were the result of hazards characteristic of the industry, the paper machines and the raw stock storage sections being the chief points of danger.

In one instance, a hot-box ignited the paper going through the rolls and in another the friction of one of the belts in the paper machine ignited oil in an oil cup and the flames were carried to the roof of the structure by the moving belt. In another case, the overheating of a cylinder in a fourdriner set fire to the dryer belt. On another occasion paper became clogged about a bearing in the lower part of the machine and the resulting friction caused the paper to ignite. In still another instance a belt caused a fire by its frictional contact with a post.

The analysis of the National Board tabulations also indicates that friction, "Sparks from machinery," constitutes one of the chief dangers about pulp and paper mills, although there are a good many spontaneous combustion fires and numerous cases of "exposure," or fire communicated from outside sources.

Safeguards

In the matter of safeguards, the structural factor occupies a leading position. Plants should have walls of brick, stone or reinforced concrete, and should be not more than two stories and basement in height. Roofs should be of non-combustible materials and stairways should be inclosed and cut off with approved, self-closing fire doors. In some cases, trap doors at the top of each flight of stairs, operating automatically by means of fusible links, may be used in lieu of stairway enclosures, the important thing being to retard the spread of any fire that may spring up. Elevator shafts should likewise be inclosed and windows should be glazed with wired glass. Boilers should be located in a detached unit, if possible, or at least safely cut off from the main structure, and boiler stacks should be of brick or metal on a solid foundation and should run at least 2 feet above the roof. If the stack is of metal, it should have a clearance of at least 12 inches on all sides where it passes through the roof. A metal ventilating collar is recommended for use at this point.

In the mechanical mixing of pulp, there is no special hazard involved except that of hot bearings and the presence of refuse products. The chipper employed in making sulphite pulp should be kept clean and not allowed to become loose, owing to the likelihood of ignition from friction. All belts and shafting should be given special attention and maintained in first class condition. As a practical safeguard, shafting and machinery should be electrically grounded so as to carry off whatever static electricity may be generated by friction.

Where lime is used it should be stored in a detached unit and kept thoroughly dry.

Sulphur burners should be soundly built of brick and located in a structure separated from the main building and from the section where the main stock of sulphur is stored. If the burner is close to the parent plant, it should be cut off by a solid wall.

Although the National Board tabulation shows no losses due to steam or hot water pipes, the steam-heated digesters, and their connecting pipes, should be kept free from burnable material.

A number of blazes have occurred from the spontaneous ignition of baled stocks of rags and the different grades should be stored separately, since mixing accentuates this danger. It is not safe to leave rag stocks on platforms or in the yard, as they are likely to catch fire from sparks emitted by railroad locomotives, plant stacks, or from the matches of careless smokers.

Apparatus for cleaning rags should be equipped with blowers which carry off the dust through metal flues. Bearings of the duster should be located outside of the machine and kept well oiled so as to avoid friction. Needless to say, good housekeeping is important here as in all other parts of the plant.

Most of the chemicals used in the manufacture of paper are not hazardous, although chloride of lime will liberate oxygen when heated and consequently should not be exposed to either artificial heat or to the sun. Lime has already been referred to. Rosin is not considered particularly dangerous.

The bearings of the fans used to dry wet stock should be carefully looked after as there have been a number of cases of overheating. Scraps of paper due to the tearing of sheets going through the machines should not be allowed to accumulate but should be regularly gathered up and placed in the beater for reworking.

If gas jets are used for melting sealing wax, or other purposes, they should be provided with rigid metal piping.

Cost Accounting for Paper Mills

Part III---Development of Standard Burden

By CHARLES WILLIAM GOULD, JR.

The next chapter of this series of six articles by Mr. Gould, which will appear soon in another issue of The Paper Industry, will deal with Costing the Product and Manufacturing Costs.

BEFORE proceeding with the development of the burden or overhead charges, let us take a trip through the plant. In the main office the treasurer is engaged in signing a batch of checks; in the outer office the bookkeeper is posting yesterday's sales. A short distance away we observe several clerks and stenographers busily engaged, earning salaries and using supplies and stationery for which, perhaps, the treasurer has just signed a check.

Passing on to the mill we meet the superintendent escorting an injured workman to the first-aid station and miss being run down by a truck delivering shipments from the freight depot. Inside the superintendent's office, a girl is weighing coloring material on a scale registering fractions of an ounce.

Out in the mill everybody is hustling. The washers and beaters are humming their familiar tunes. In the paper-machine room, the boss machine-tender is directing the make-ready on one of the big paper machines. Over yonder a woman is seen cleaning windows and we step aside to make way for a load of paper in its passage to the loft. We continue on our way to the finishing department and note the terrific speed at which the paper passes through the huge web-calenders. A glance to the left discloses a boy drawing a broom from the store-room and we observe in amazement the brooms, brushes, pails, belting, sand-paper, soap, nails and the hundred other articles stored there.

We pass on to the stock-room and turn on the lights to dispel the darkness. The stock-man reminds us that a new roof is needed—the old one leaks. We go into the machine shop, a mechanic is repairing a broken casting, the master-mechanic is elsewhere with his crew erecting a new machine. We glance into the boiler-house and the heat of burning fuel is felt through our clothing.

Now let us go back into the office and decide the best way to charge all these things we have seen to the cost of making a pound of paper.

In calculating the cost of manufacturing paper, it is relatively a simple problem to determine the elements of material and labor cost for each lot. It is in the proper distribution and application of the burden or overhead charges to the cost of the product that the more serious difficulties are encountered, yet burden is a very important factor of cost.

All items of expense should be allocated as nearly as possible to the product for which such items of expense are made. Since practically all of these expenses are incurred by or for certain operations or departments, rather than for any part of the product, it follows that these items of expense should be charged direct, if possible, or at least, distributed to these operations or departments according to the benefits they receive from such expenditures. The total expenses of these departments or operations should then be applied to the product on some basis which accurately measures the expense earned or absorbed by the product as it passes through the successive operations or processes.

To that end, we have divided the mill into departments or centers in accordance with the operations or processes performed (See Burden Ledger Accounts—Pap. Ind., Aug. '26, Pg. 806). For each of these centers, a total annual burden should be determined which should consist of some or all of the following charges—Taxes, Insurance, Depreciation, Interest, Repairs, Indirect Labor, Supplies and Expense, Compensation Insurance, Steam, Electric Power, Water Power and Water Supply.

After having distributed these charges to the individual centers, we are able to calculate a machine hour, man hour or process rate for each producing center or operation, this rate being the medium through which the burden is charged to the cost of the product.

The complete development of the standard burden for the cost systems under consideration will be shown with the aid of three kinds of statements

which we shall designate as Appendixes, Exhibits and Schedules.

On the exhibits we shall assemble the total standard burden charges for each center. In developing these charges, it will be necessary to make some preliminary calculations which will be shown in detail on the appendixes. After all the factors which make up the standard burden of each center are entered on the exhibits, they will be summarized on schedules.

Recapitulation of Plant Values

The values of the various classes of fixed assets and average inventories are assembled on this appendix (Fig. 8). The total of these items, which are illustrative and not actual, represents the amount of capital invested for manufacturing purposes and are used as the basis of all fixed charges, such as Taxes, Insurance, Depreciation and Interest.

A word of explanation concerning the building up of this appendix may be helpful. As was previously pointed out, a plant ledger card should be maintained for each item of equipment (See Fig. 1.—Pap. Ind., Sept. '26, Pg. 972), and the ledger so arranged to show plant values by classes of assets, divided by departments or operating centers and further subdivided by classes of equipment. Providing such a ledger is in use, it is only necessary to draw off a trial balance of the Building Fixtures and Machinery and Equipment accounts by classes of equipment.

RECAPITULATION OF PLANT VALUES

		Appendix A-1
Water Rights		$ 50,000
Land		75,000
Mill Buildings		350,000
Building Fixtures		
Elevators	$ 10,000	
Plumbing	3,000	
Fire Protection Equipment	20,000	
Lighting Fixtures	5,000	
Time Detector Systems	2,000	
		40,000
Machinery and Equipment		
Dams, Wells and Reservoirs	$ 40,000	
Underground Piping	25,000	
Railroad Tracks and Trestles	10,000	
Fences, Sidewalks and Roadways	8,000	
Miscellaneous Paper Mill Machinery	450,000	
Pumps and Engines	30,000	
Machine Tools	10,000	
Steam Plant and Steam Trans. Ep'm't	50,000	
Motors and Electrical Equipment	110,000	
Brick Drainers	15,000	
Tubs, Tanks and Vats	10,000	
Shafting and Pulleys	20,000	
Electric Wiring	20,000	
Manufacturing Pipe	25,000	
Trucks and Scales	8,000	
Benches, Tables and Racks	25,000	
Miscellaneus Equipment	5,000	
		861,000
Furniture and Fixtures		10,000
Trucks and Automobiles		15,000
Average Inventories		
Rags and Pulp	$200,000	
Sizing, Chem., Coal and Supplies	100,000	
Half Stock	40,000	
Rough and Finished Paper	300,000	
		640,000
TOTAL PLANT VALUES AND AVERAGE INVENTORIES		$2,041,000

Figure 8

Taxes

The amount of taxes chargeable to manufacturing burden is expressed as a percentage of the plant values as shown on the Recapitulation of Plant Values, this percentage being used in determining the distribution of this charge.

Determination of Tax Rate

$$\frac{\text{Total Plant Values Less Water Rights, \$1,991,000}}{\text{Total Taxes on Plant and Equipment, \$26,000}} = .013008$$

Use rate of 1.3%

Tax on Tenements is charged directly to the Tenement Expense account as will be explained later.

Insurance

The charge for general insurance consists of the total of all fire insurance premiums, the annual premium being expressed as a percentage of the total plant values less the value of land and water rights. This percentage is also used in determining the distribution of the charge for insurance.

Determination of Insurance Rate

$$\frac{\text{Total General Insurance, \$2,500}}{\text{Total Plant Values Less Land and Water Rights, \$1,916,000}} = .001304$$

Use rate of .13%

Steam Boiler, Rotary Cooker and Automobile Insurance are charged directly to the centers involved as will be explained later.

Depreciation

Depreciation refers to the inevitable lessening in value inherent in any fixed asset used in a business, except land. Depreciation must not be confused with fluctuation. Depreciation is the permanent reduction of value in an asset used for producing profits. Fluctuation in value may be upward as well as downward, but depreciation, representing the eventual destruction of an asset must always have a downward trend.

Fixed assets are not acquired for the purpose of being sold, therefore temporary fluctuations do not affect their value to the business. Their value, however, is affected by the depreciation which causes a permanent reduction in value. For this reason, fluctuation in the value of fixed assets is disregarded in the accounts while depreciation finds legitimate expression on the books as an operating expense.

However thorough and complete may be the repairs and replacements made in a fixed asset, it can never be maintained at its original value, or in its original state of efficiency. Deterioration from use or from age is a universal law, whose effect must be realized and provided against as it occurs. Usually the process is very gradual, so much so that many

persons are inclined to pay but scant attention to it until they are confronted with the necessity of entirely reconstructing a building or replacing a machine. When the management of a business fails to provide against the inevitable destruction or uselessness of a fixed asset, they place themselves in a position which requires them to charge the entire cost of the asset against the profits of the one year in which it is finally discarded or replaced.

There are a number of different methods of computing depreciation, some of which are quite complicated. In this system the "straight line" or fixed per cent on original cost method, which is very commonly used and is the one favored by the Treasury Department in income tax matters, will be used. The amount of depreciation to be written off annually is a fixed per cent of the original value based on the number of years of the estimated service life of the asset. Thus, if the service life is estimated at five years, the annual depreciation would be one-fifth, or 20 per cent of the original value.

Depreciation upon the various classes of assets will be computed at the following rates, which are customarily used on the types of equipment represented:

Classes—	%	Classes—	%
Mill Buildings	3	Motors and Electrical Equipment	8
Dams, Wells and Reservoirs	7	Brick Drainers	3
Underground Piping	2	Tubs, Tanks and Vats	12
R. R. Tracks and Trestles	15	Shafting and Pulleys	10
Fences, Sidewalks and Roadways	15	Electric Wiring	10
Miscellaneous Paper Mill Machinery	5	Manufacturing Pipe	10
Pumps and Engines	8	Trucks and Scales	15
Machine Tools	7	Benches, Tables and Racks	10
Steam Plant and Steam Transmission Equipment	8	Miscellaneous Equipment	10
		Office Furniture and Equipment	10
		Trucks and Automobiles	20

Repairs to buildings will be considered as a fixed charge and calculated at 2 per cent of the building values. This reserve should be sufficient to provide for major repairs, such as a new surface for a roof, or a new floor. In this way the cost of major repairs is spread over a considerable period.

I have discussed the three divisions of fixed charges; namely, Taxes, Insurance and Depreciation. Now for the much mooted question, "Should an estimated allowance for interest on investment receive explicit recognition in the accounts as an operating expense?" I fully realize that this is a debatable question on which there appears to be a wide divergence of opinion; however, interest at the rate of 5 per cent per annum is included here so that its treatment in the accounts may be understood. It may be omitted if desired without changing the system.

Fixed Charges

The total fixed charges, shown in the extreme right hand column of Appendix A-2 (Fig. 9) are carried to the various exhibits through Appendix A-3, Fixed Charges Land and Buildings (Fig. 10); Appendix B, Fixed Charges Machinery and Equipment (Fig. 11); and Appendix C, Miscellaneous Fixed Charges (Fig. 12).

On Appendix A-3, Fixed Charges Land and Buildings, are calculated the total fixed charges on land and buildings, including the cost of buildings and grounds expense. After the burden centers are established and named, or given a designating number, the boundaries and floor areas of each center should be determined. In doing this, there will be some space which cannot be properly allocated to any one department. This space is commonly termed "Service Space"; it includes hallways, stairways, elevator wells, wash-rooms, etc., and is included in the center designated General Mill Burden. The space used for main aisles and gangways should be absorbed in the departments using them. A convenient method of keeping record of and of following up changes in department areas and boundaries is to have blue prints of each floor struck off on a convenient scale and pencil tracings made of the boundaries of each department, which can be easily altered as changes occur.

The total cost of building and grounds expense should be determined and should consist of some or all of the following charges: Taxes, Insurance, Depreciation, Interest, Repairs, Indirect Labor, Supplies and Expense, Compensation Insurance, Steam and Electric Power and Water. The total of these various items should be classified under the headings of

FIXED CHARGES Append. A-2

ITEMS	VALUE	INTEREST 5%	TAXES 1.3%	INSURANCE .13%	BUILDING REPAIRS	DEPRECIATION VALUE	DEPRECIATION RATE %	DEPRECIATION ANNUAL CHARGE	TOTAL FIXED CHARGES
A-3 LAND AND BUILDINGS									
Land	75,000	3,750	975						4,725
Buildings	350,000	17,500	4,550	455	7,000	350,000	3	10,500	40,005
TOTAL	425,000	21,250	5,525	455	7,000	350,000	3	10,500	44,730
B MACHINERY & EQUIPMENT									
Building Fixtures	40,000	2,000	520	52		40,000	7	2,800	5,372
						73,000	8	1,460)	
						16,000	3	480)	
						416,000	5	20,800)	
Machinery & Equipment	861,000	43,050	11,193	1,119		17,000	7	1,190)	111,452
						192,000	8	15,360)	
						96,000	10	9,600)	
						15,000	12	1,800)	
						36,000	15	5,400)	
Furniture & Fixtures	10,000	500	130	13		10,000	10	1,000	1,643
Trucks & Automobiles	15,000	750	195	20		15,000	20	3,000	3,965
TOTAL	926,000	46,300	12,038	1,204		926,000	6.77	62,890	122,432
C MISCELLANEOUS									
Water Rights	50,000	2,500							2,500
Average Inventories									
Rags & Pulp	200,000	10,000	2,600	260					12,860
Sizing, Chem. etc.	100,000	5,000	1,300	130					6,430
Half Stock	40,000	2,000	520	52					2,572
N & F Paper	300,000	15,000	3,900	390					19,290
Boiler Insurance				402					402
Rotary Cooker Insurance				38					38
Automobile Insurance				175					175
Tenement Three			1,842						1,842
TOTAL	690,000	34,500	10,162	1,447					46,109
SUMMARY									
A-3 LAND AND BUILDINGS	425,000	21,250	5,525	455	7,000	350,000	3	10,500	44,730
B MACHINERY & EQUIPMENT	926,000	46,300	12,038	1,204		926,000	6.77	62,890	122,432
C MISCELLANEOUS	690,000	34,500	10,162	1,447					46,109
TOTAL	2,041,000	102,050	27,725	3,106	7,000	1,276,000	5.75	73,390	213,271

Figure 9

Heating, Lighting, Fire Protection and General Expense and should be distributed to the centers on the bases of the floor area in each department. These charges are carried to Appendix A-3, Fixed Charges Land and Buildings, from which they enter the burden of the various centers through the square foot area charge. The charges to the individual centers as shown on this appendix are carried to the exhibits representing the various centers and listed there opposite the letter A.

Appendix B shows the distribution of machinery and equipment to the burden centers together with the calculation of the fixed charges on this equipment for each center. The total value of the equipment in each center is first shown in total and then the individual items are distributed according to the rates of depreciation used. The rates of depreciation for the different classes are listed in a preceding paragraph. The columns at the right of this appendix show the fixed charges on the equipment for each center and are carried to the exhibits representing the burden centers and listed there opposite the letter B.

On Appendix C are shown those fixed charges which do not apply to the mill as a whole, but which are chargeable to a particular department. The values of the average inventories set up in Appendix A-1 are here distributed and the carrying charges calculated at the rates developed. The fixed charges on the water rights and the miscellaneous insurance and tax charges applicable to individual centers are also shown on this appendix. The amount of miscellaneous fixed charges for each department is carried forward in total to the exhibits for the various departments and there shown opposite the letter C.

An exhibit should be prepared for each burden center (See Exhibit No. 7—Fig. 13), on which will be shown by classes of expense the estimated annual charges applying to the center. These exhibits should also show the floor space area, the various items of equipment, together with all items of information

FIXED CHARGES LAND AND BUILDING

Append. A-3

ITEMS	VALUE	FIXED CHARGES	BUILDING AND GROUND EXPENSE	TOTAL CHARGES	AREA SQUARE FEET	RATE PER SQUARE FOOT
Land	75,000	4,725		4,725		
Buildings	350,000	40,005	32,320	72,325	218,010	
TOTAL	425,000	44,730	32,320	77,050	218,010	.3534

DISTRIBUTION OF LAND AND BUILDING CHARGES

EXHIBIT NUMBER	BURDEN CENTER	CENTER AREA SQUARE FEET	CHARGES PER SQUARE FOOT .3534
1	Rag Preparation	8,973	3,171
2	Rag Cutting & Cut Rag Storage	5,671	2,004
3	Rag Cooking	1,262	446
4	Rag Washing	9,671	3,418
5	Stock Digging	8,420	2,975
6	Beaters	13,782	4,871
7	Paper Machine #1	7,419	2,622
8	Paper Machine #2	8,112	2,867
9	Paper Machine #3	7,984	2,821
10	Loft Drying	14,128	4,995
11	Air Drying	8,480	2,997
12	Sheet Calenders	3,750	1,325
13	Web Calenders	3,640	1,286
14	Platers	1,109	392
15	Cutters	736	260
16	Sorting & Counting	6,497	2,296
17	Trimming & Sealing	1,394	493
18	Rough & Finished Paper Storage	29,842	10,549
20	Preparing Paper Stock	380	134
31	Preparing Rosin Size	1,505	532
32	Preparing Animal Size	1,633	577
40	Steam	11,627	4,109
41	Electric Power	640	226
50	Rag Stock Handling & Storage	20,720	7,322
51	General Stock Handling & Storage	8,341	2,948
52	Maintenance	6,420	2,269
53	Case Making & Finished Cases	1,629	576
54	Trucking	326	115
55	Water Supply	1,119	395
56	Water Power		
57	General Mill Burden	13,420	4,743
58	Building & Ground Expense	200	71
59	Unused Space & Equipment	1,158	409
60	Packing & Shipping	2,040	721
61	Samples	1,004	355
62	Advertising	2,118	749
63	Administration	2,860	1,011
64	Tenements		
	TOTAL	218,010	77,050

Figure 10.

FIXED CHARGES MACHINERY AND EQUIPMENT

Append. B

EXHIBIT NUMBER	BURDEN CENTER	TOTAL EQUIPMENT	EQUIPMENT VALUES WITH DEPRECIATION RATES 2%	3%	5%	7%	8%	10%	12%	15%	20%	FIXED CHARGES INTEREST 5%	TAXES 1.3 %	INSURANCE .13%	TOTAL DEPRECIA'N	TOTAL CHARGES
1	Rag Preparation	15,000			10,500			2,500		2,000		750	195	20	1,075	2,040
2	Rag Cutting & Cut Rag Storage	8,000						3,000		5,000		400	104	10	1,050	1,564
3	Rag Cooking	10,000			8,000			2,000				500	130	13	600	1,243
4	Rag Washing	32,000			30,000		500	250	750	500		1,600	416	42	1,730	3,788
5	Stock Digging	16,500		16,000						500		825	215	21	535	1,616
6	Beaters	49,900			44,000		1,000	3,900		1,000		2,495	649	65	2,820	6,029
7	Paper Machine #1	85,000			65,000		8,000	8,500	1,500	2,000		4,250	1,105	111	5,220	10,686
8	Paper Machine #2	87,000			64,250		8,500	10,750	1,500	2,000		4,350	1,131	112	5,448	11,041
9	Paper Machine #3	89,000			70,000		8,400	6,520	1,580	2,200		4,450	1,157	116	5,379	11,102
10	Loft Drying	7,000						4,500		2,500		350	91	9	825	1,275
11	Air Drying	45,700			39,000		2,000	3,700		1,000		2,285	594	59	2,630	5,568
12	Sheet Calenders	25,000			23,000			1,500		500		1,250	325	33	1,375	2,983
13	Web Calenders	35,000			33,000			1,750		250		1,750	455	46	1,863	4,114
14	Platers	7,500			5,500			1,750		250		375	98	10	487	970
15	Cutters	7,000			6,000			750		250		350	91	9	413	863
16	Sorting and Counting	6,500						3,500		3,000		325	84	8	800	1,217
17	Trimming and Sealing	12,375			11,750			425		200		619	161	16	660	1,456
18	Rough and Finished Paper Storage	6,175						4,675		1,500		308	80	8	693	1,089
20	Preparing Paper Stock	3,850			2,000		350		1,450	50		193	50	5	110	558
31	Preparing Rosin Size	1,750					750		2,950	50		188	49	5	421	663
32	Preparing Animal Size	5,420					500		4,970	150		281	73	7	659	1,020
40	Steam	35,000					13,000	2,000				1,750	455	46	2,840	5,091
41	Electric Power	115,500					113,000	2,500				5,775	1,500	150	9,290	16,715
50	Rag Stock Handling and Storage	6,470						3,470		3,000		323	84	8	796	1,211
51	General Stock Handling and Storage	5,500						2,500		3,000		275	72	7	700	1,054
52	Maintenance	20,960				17,000		3,960				1,048	272	27	1,586	2,933
53	Case Making and Finished Cases	2,000						1,500		500		100	26	3	225	354
54	Trucking	15,000									15,000	750	195	20	3,000	3,965
55	Water Supply	52,000	40,000				9,000	3,000				2,600	676	68	1,820	5,164
56	Water Power	15,000	12,000				3,000					750	195	20	480	1,445
57	General Mill Burden	22,000	5,000			6,000		6,900		4,100		1,100	286	28	1,825	3,239
58	Building and Ground Expense	50,000	16,000			34,000						2,500	650	65	2,700	5,915
59	Unused Space and Equipment	8,000			4,000		4,000					400	104	10	520	1,034
60	Packing & Shipping	2,200						1,700		500		110	29	3	245	387
61	Samples	1,500						1,500				75	20	2	150	247
62	Advertising	2,000						2,000				100	26	3	200	329
63	Administration	15,000						15,000				750	195	19	1,500	2,464
64	Tenements															
	TOTAL	926,000	73,000	16,000	416,000	57,000	192,000	106,000	15,000	36,000	15,000	46,300	12,038	1,204	62,890	122,432

Figure 11

pertinent to the respective centers. The amounts of the various charges shown on the exhibits are derived from the appendixes. References should be made to the exhibits whenever questions arise as to the proper distribution of manufacturing expense. This is very important because reliable comparative figures from period to period depend upon a proper allocation of such charges.

Indirect Labor Distribution

By indirect labor is meant that labor which is charged as a part of the burden, as distinguished from direct labor which is charged direct to a particular lot number. All labor with the exception of rag hand cutting and rag inspection, the sheet calendering and plate operators, and the labor of paper sorting will be considered as indirect. This method is adopted since most of the so-called productive labor is so much a part of the machine operation in some cases, and very uniform as to distribution over the product passing through a department in others, that more accurate results and greater simplicity are obtained by treating this labor as part of the burden and applying it to cost as a part of the burden rate.

An appendix should be prepared for the indirect labor distribution in a manner similar to that described for the distribution of fixed charges. This appendix should show the exhibit numbers and burden centers; the number of indirect and direct employees, together with the estimated annual indirect labor, divided as to general, supervision and clerical and idle time. The total indirect labor for each department thus shown will be extended. The estimated annual direct labor for the operations previously mentioned should also be recorded and the totals of both indirect and direct labor extended, thereby giving the total estimated labor charges for each operating center and the mill as a whole.

In distributing the payroll at the close of each payroll period, the classification as shown on the appendix should be followed. The total of indirect labor as recorded on this appendix should be carried to the exhibits and recorded opposite the letter E.

MISCELLANEOUS FIXED CHARGES Append. C

EXHIBIT NUMBER	BURDEN CENTER	FIXED CHARGES ON AVERAGE INVENTORIES: INTEREST ON WATER RIGHTS	RAGS AND PULP	SIZING CHEM., COAL, ETC.	HALF STOCK	N. & F. PAPER	INSURANCE MISC.	TAXES ON TENEMENTS	TOTAL CHARGES
3	Rag Cooking						38		38
6	boilers				2,572				2,572
18	n. & F. Paper Storage					19,290			19,290
40	Steam						402		402
50	Rag Stock Handling & Storage		12,860						12,860
51	Gen. Stock Handling & Storage			6,430					6,430
54	rucking						175		175
55	ater Supply	2,325							2,325
56	Water Power	175							175
64	Tenements							1,842	1,842
	TOTAL	2,500	12,860	6,430	2,572	19,290	615	1,842	46,109

Figure 12

BURDEN CENTER—PAPER MACHINE NO. 1

July 1, 1926 Exhibit No. 7

APPENDIX	NAME				ANNUAL CHARGE
A-3	FIXED CHARGES LAND AND BUILDINGS.				
	Basement .....2,842 Sq. Ft.				
	First Floor .....4,577 Sq. Ft.				
	Total .....7,419 Sq. Ft. @ $.3534				$ 2,622
B	FIXED CHARGES MACHINERY & EQUIPMENT.				
	Item No. Kind	Value	Rate	Amt.	
	1 Misc. Paper Mill Machinery	65,000	5%	3,250	
	2 Pumps & Engines	8,000	8	640	
	3 Shafting & Pulleys	1,750	10	175	
	4 Manufacturing Pipe	5,640	10	564	
	5 Benches, Tables & Racks	1,110	10	111	
	6 Tubs, Tanks & Vats	1,500	12	180	
	7 Trucks & Scales	2,000	15	300	
	8 Total	85,000		5,220	
	8	85,000	5	4,250	
	8	85,000	1.3	1,105	
	8	85,000	.13	111	
	Total			5,466	10,686
C	Miscellaneous Fixed Charges		None		
D	Total Fixed Charges				13,308
E	Indirect Labor				11,642
F	Supplies & Expense				3,480
G	Compensation Insurance				112
H	General Mill Burden				1,540
K	Steam				8,623
L	Electric Power & Water Power				2,860
M	Water				1,000
N	Repairs				1,600
O	Total Estimated Burden				44,165
	Total Estimated Burden / Estimated Annual Productive Machine Hours	$44,165 / 5,400	=$8.1787		

Use Rate of $8.18 Per Machine Hour

Figure 13

Supplies and Miscellaneous Expense

This appendix should show the estimated annual cost of supplies for the several burden centers, and arranged in accordance with the following classification:

3	General Supplies	3H	Knives
3A	Lubricants	3K	Chemicals (Rag Cooking)
3B	Belting and Belting Supplies	3L	Cases, Crates and Frames
3C	Felts—First	3M	Nails and Straps
3D	Felts—Second	3N	Lining Paper
3E	Felts—Dryer	3O	Coal
3F	Wires		
3G	Jackets		

These estimates should not include any charges for repair material as such material will be treated as part of the cost of repairs.

This appendix will also include such miscellaneous items of expense as:

4	General Expense	4C	Electric Power (Purchased)
4A	Grinding Rolls	4D	Trucking
4B	Grinding Knives		

The cost of trucking as calculated on Exhibit No. 54 should be distributed as expense to the various centers requiring this service. The total estimated cost of supplies and miscellaneous expense for each department will be extended and the totals thus obtained listed on the individual exhibits opposite the letter F.

Compensation Insurance

This charge will be based on the total estimates for both indirect and direct labor as shown on Appendix E, and the latest premium rates obtainable. The peri-

odical charge will be obtained by analyzing the payroll by Burden Centers and applying the rate for the class of labor in that center. This charge should appear on the exhibits opposite the letter G.

Distribution of General Mill Burden

This appendix shows the distribution of the estimated general mill burden as developed on Exhibit No. 57. The charges assembled under this heading are those which are not directly applicable to any particular center, but which apply to the mill as a whole, such as first aid, laboratory expense and miscellaneous items about the mill. The distribution is based upon the number of employees in each department as shown on Appendix E, Indirect Labor Distribution.

The redistributed centers are not to be charged with general mill burden as the theoretical accuracy thus obtained does not warrant the work involved in the cross calculation; charges for this class of expense are to be recorded on the exhibits opposite letter H.

Electric, Steam and Water Power Distributions

The distribution of Indirect Labor, Supplies and Miscellaneous Expense forms, in most instances, an individual unit charge under some method that is both simple and practical. The factors of electric, steam and water power distributions are not quite so simple. Ahead of us now, we see a pile of coal, a battery of generating machinery, motors, transmission equipment carrying the fluid of mechanical life to all parts of the plant to machines of various power consumption, friction and loss of energy varying as to distance, load or resistance. To obtain the right proportion of power consumed by each in a manner that is better than a rough guess seems an impossibility. However, some means must be found to determine the right proportion of power consumption in each department, which is simple and at the same time dependable enough to form the bases of our distribution.

The most desirable and by all means the most advisable arrangement is the installation of an independent meter for each manufacturing department. In this case the current consumption is under control, and the department power and light burden is obtained directly.

If this is impossible, the installation of an independent meter on each floor is the next best proposition. In this instance the power must be divided among the departments under the common meter, in a manner to be described in the next case.

Under the most unfavorable conditions, the mill must possess one meter for the measurement of the total mill consumption which makes it necessary either to obtain the power and light share of the various departments by mathematical computation, or by the means of trial runs. Both of these methods are somewhat tedious and should be left to the personal choice of the management to decide the better method.

Reference should be made to the Electric Power section in the Plant Ledger and all motors, serving the various burden centers listed together with their Horsepower capacity. This data should be arranged departmentally under the following headings: Machine Number, Size of Motor, Capacity Used, K. W. Units, Deductions from Full Load, K. W. Consumed, K. W. H. Per Month.

Under this method of calculation it will be necessary to estimate the capacity or load of the motor, also the deduction from full load, based upon the time the motor is actually working. The combined judgment of the superintendent, engineer and department foreman will come close to actual conditions and can usually be accepted as dependable.

Since one horsepower is equal to .746 K. W. units, the remainder of the table is but a simple calculation. The percentage relation of the departmental totals to the grand total will be the base of the distribution of electric power. The charges for electric power are entered on the exhibits opposite the letter L.

For the other two forms of power—namely, steam or water—the calculations are more cumbersome. With these two motives, the only practical solution is the estimate. There is hardly a mill organization where the judgment of the management or department heads is not competent enough to estimate the individual units sufficiently close for the burden factor. The charges for steam should appear opposite the letter K, while the charges for water power may be combined with the charges for electric power and shown opposite the letter L or shown separately.

Distribution of Water Supply

The total annual charges for water supply as developed on Exhibit 55 should be distributed to the various centers, based upon the number of gallons required yearly by the departments using water. The figures denoting the requirements of the centers should be reduced to a percentage of the total. The charge for water supply should be recorded on the exhibits opposite the letter M.

Repairs

The annual charge for repairs to machinery and equipment in each burden center may be safely estimated from past experience. The total charges for repairs, which should include labor and burden and also repair materials, will be recorded on the corresponding exhibits opposite the letter N.

Schedules

Summary of Charges by Centers—Schedule 1 should be so arranged to show the amount of each element of burden charged to the burden centers, recapitulating the total of the appendixes and show-

ing the resulting departmental burden, which should be in agreement with the amounts as recorded on the individual exhibits. These data should be assembled under the following headings:

Exhibit Number	Burden Center	
Appendix	A-3	Fixed Charges Land and Buildings
"	B	Fixed Charges Machinery and Equipment
"	C	Miscellaneous Fixed Charges
(Summary)	D	Total Fixed Charges
Appendix	E	Indirect Labor
"	F	Supplies and Miscellaneous Expense
"	G	Compensation Insurance
"	H	General Mill Burden
"	K	Steam
"	L	Electric Power and Water Power
"	M	Water Supply
"	N	Repairs
"	O	Total Estimated Burden

This schedule will be used to calculate the Standard Periodical Debit Journal Entry, Schedule 3.

Summary of Burden Charges by Expense Classes —Schedule II—This schedule shows the accumulation by classes of all of the charges included in the burden and shown on the appendixes and exhibits, and the total should be in agreement with Schedule 1 where these charges have been distributed by centers. The fixed charges as shown on this schedule are used as a basis for the Standard Periodical Journal Entries—Credits, for fixed charges as described for Schedule 4.

Standard Periodical Journal Entries—Debits, Schedule III—Schedule III is the standard periodical journal entry which carries the fixed charges to the various burden center accounts. This schedule will show departmentally the charge for a four-week period and also the figures for a five-week period. These charges as previously explained in our discussion of Appendixes A-3, B, and C, consist of interest on investment, taxes, insurance, depreciation and building expense charges.

Standard Periodical Journal Entries—Credits, Schedule IV—On this schedule are shown the offsetting credits to the charges made from Schedule III. These credits should be made to the various expense or reserve accounts with the exception of the item interest on investment which should be credited to account J-5 Interest Charges to Cost.

A schedule should also be prepared on which are shown the various bases used and applied to the total annual burden in each productive center to determine a rate to be used in applying burden, and so designed to show the center name and number, the standard productive units for the year and also for a four-week period and a five-week period, together with the standard burden rates as developed on the exhibits.

Comparative Statement of Burden

One sheet of the comparative statement of burden will be used for each of the operating departments or burden centers, on which in the space headed Analysis, should be shown the details to be carried for the operating expenses of that center. In the column headed Standard, the standard amount calculated for each of the various charges to the department will be shown. The standards for a four-week period are entered on the top lines and those for a five-week period on the bottom lines.

Each set of columns headed Amount and Variance will be used for a period. The periods should be of even weeks, corresponding as closely as possible with the calendar months. For the first period, in the column headed Amount, as shown in the accompany-

COMPARATIVE STATEMENT OF BURDEN

DEPARTMENT Paper Machine No. 1

ANALYSIS	NO	PERIOD	January 30 1926					
		STANDARD	AMOUNT	VARIANCE		AMOUNT	VARIANCE	AMOUNT	VARIANCE
Repairs	1	123 08 153 85	241 18	118 10	R				
Indirect Labor General	2	846 17 1,057 69	703 20	142 97					
Indirect Labor Supr. & Clerical	2a	49 36 61 72	49 37	01					
Supplies-General	3	15 36 19 23	70 02	54 66	R				
Lubricants	3a	3 85 4 81	75	3 10					
Belting & Supplies	3b	19 23 24 04	8 00	11 23					
Felts-First	3c	40 38 50 48		40 38					
Felts-Second	3d	32 69 40 87	99 80	67 11	R				
Felts-Dryer	3e	23 08 28 85		23 08					
Wires	3f	69 23 86 54		69 23					
Jackets	3g	23 08 28 86		23 08					
Knives	3h	7 70 9 62	2 40	5 30					
Expense-General	4	15 77 19 71	25 75	9 98	R				
Grinding Rolls	4a	7 70 9 62	5 50	2 20					
Grinding Knives	4b	9 62 12 02	2 75	5 87					
Liability Insurance	5	8 62 10 77	6 91	1 71					
TOTAL DIRECT CHARGES		1,294 96 1,618 69	1,216 63	78 33					
Water Supply	6	76 92 96 16	69 14	7 78					
Steam	7	663 31 829 14	557 49	105 82					
Electric Power	9	220 00 275 00	204 02	15 98					
General Mill Burden	10	118 46 148 08	110 09	8 37					
Fixed Charges	12	1,023 69 1,279 62	1,023 69						
TOTAL BURDEN CHARGES		3,397 34 4,246 68	3,181 06	216 28					
BURDEN EARNED			3,231 10						
BALANCE UNEARNED			50 04	R					
HOURS CHARGED TO LOTS MADE		415 519	395	20	R				

Figure 14

ing illustration, the actual charges for the four-week period ended January 30 are shown. In the column headed Variance, the difference between the actual charges and the standard charges are recorded. If the actual charges are greater than the standard, the entry in Variance column will be made in red ink, representing a loss and in black ink if a gain. In addition, for subsequent periods the cumulative totals for the year to date will be shown on the bottom lines.

This classification of the operating expenses shows first, the direct expenses over which the head of the department has some control. This is a sub-footing of the totals of these charges to compare one period with another. Below this total of direct charges are shown the distributed charges, together with the fixed charges to give the total burden for the department.

The work done in each department or center should

be figured at a cost per hour, per pound, or some other basis, and the total charges to the product made will represent the burden earned by the department. This earned burden will be posted to the proper comparative statement of burden sheets for the various departments from a journal voucher and the net total of all balances will be a debit or credit, as the case may be, to account number B-40 Burden Control, and the corresponding debit or credit to account number J-2 Under-absorbed (or over-absorbed) Burden.

For statistical purposes there will be shown at the bottom of the sheets for each department the hours charged, units made, or other basis used for figuring the burden earned, indicating in the column headed Variance, how far the actual units each period have been ahead or behind the standard. These data should be shown by periods and also cumulatively to date and should be compared each period with the corresponding total burden, since this comparison provides a useful indication of departmental operation.

These sheets are so designed that with a short sheet, there will be provided columns for each of the twelve financial periods of the year and a final total for the year as a whole.

New Tax Developments and Rulings Affecting 1927

A Summary of Things to Remember

By M. P. SNOW
Public Accountant and Tax Consultant

Tax Advice

This is the last of a series of twelve articles written by the above author for this publication. This is your last chance to get tax information from a nationally known tax authority, and under this special arrangement with the author, there will be no charge for this advice.

If you are in doubt as to whether your case is outlawed for certain years when you think you have refunds coming, or if you want to know about any tax points whatsoever, don't fail to write us. It may save you thousands of dollars.

AS THIS is written, President Coolidge is recommending a large tax saving for the United States citizen. Members of Congress are getting busy. At first it was the President's idea to distribute the huge surplus now in the Treasury to the American public in the form of reductions affecting payments being made this year—that is, payments on the year 1925, which are made in 1926. However, there has been a switch from this plan to another. This latter scheme is to make tax reductions effective for the year 1926 instead of 1927; in other words, the idea now is to cut the tax rates which you will have to pay on this year's income in the period between January and March 15th.

Opposition is bound to develop in Congress. That is always to be expected so long as there are different political parties in the same House of Congress. However, it is dangerous for any party or member of a political party to oppose such a thing as tax reduction. The Republicans know it, the Democrats know it, and the Progressives know it. There is little doubt, therefore, that some sort of tax reduction affecting 1926 will be made.

In an article which I wrote a few months ago, I predicted that there would be substantial tax cuts made in connection with the year 1926. At that time, both the President and the Secretary of the Treasury were making statements to the effect that no definite plans had been made for tax reduction. However, it is practically certain now that such reductions will be made. I am glad to be able to give you such a piece of good news in this article, and I expect you will see lower rates effective for 1926.

As this is the last of the series of twelve articles, I suggest that you hold this story over for use in filing your income tax returns between January and March 15th. There are one or two rulings which I want to recall to your mind and one or two new ones I want to tell you about. Bear these carefully in mind as you approach the task of making up your tax return for 1926.

Tax Payer Judge of Depreciation

Taxes are supposed to be more or less simple of computation nowadays. But, thousands of errors are made just the same. And, hundreds of these errors mean that the manufacturer or other taxpayer is paying more taxes than he has to. One of the points on which retailers have in a great many cases had disputes is that of depreciation. I have dwelt on this point a great many times in my articles, but I want to sum up for you in this last article the thing which you want to remember about depreciation. It is this. You are a better judge of your depreciation than anyone else, unless it be an appraisal expert, if you are in close touch with your business and business

properties. And, you can in almost any case convince the government that you are right if you submit the right kind of information. There are two recent cases decided on by the United States Board of Tax Appeals. More depreciation than was originally claimed is allowed in one instance. A deduction for obsolescence is denied in the other. In the first case, full information was submitted tending to show the justification for the higher rate. In the second instance, the Board says "There is no competent evidence in support of this claim."

You will recall the cases I cited in my first article. I will not repeat them, but I will remind you that very much higher rates were allowed certain manufacturers because they showed that these rates were proper. One taxpayer was allowed to take a rate of depreciation almost three times as great as he took in previous years, both on his machinery and building. The manufacturer **proved** his point to the satisfaction of the Board of Tax Appeals.

March 1, 1913, Value as Basis

There is another point which you have had the advantage of for a number of years but it is so poorly understood and so little known that I want to bring it up here. It is one of the greatest money-savers in the whole revenue law. It is the right to use the March 1, 1913 value. Property which you acquired before that date and sell after it is affected.

You ought to keep this point in mind in filing your return for 1926, if you have sold property acquired before March 1, 1913. If you have failed to consider this right in reporting sales in previous returns of property acquired before the above date, you should correct your reports, if they are not outlawed.

From the year 1916 to date, a taxpayer has been permitted to use the March 1, 1913 value of his property in computing his gain on sales of properties acquired before that date, and also in computing depreciation on property which came into his hands before that time. You purchased a building, let us say, on January 1, 1910. It cost you $50,000.00. It has an estimated life of 50 years. The property was located in a swiftly-growing district. By March 1, 1913, it was worth $80,000.00. In fact, you were offered that amount in the latter part of 1912. You were sure that you could do better, though, so you held on. In 1923, you sold the property for $100,000.00. There is a $50,000.00 profit over cost. A $20,000.00 profit over the March 1, 1913 value. Of course, depreciation would have to be taken in both cases. It is easy to see what a tremendous difference the right to the March 1st value can make.

Remaining Costs in Replaced Equipment

When you come to make up your tax return, you may have occasion to consider some replaced items. The Tax Unit has held that the balance of cost remaining in a replaced asset or part of asset should be added to the cost of the new part. However, the Board of Tax Appeals has, in a number of cases, held that the "unextinguished cost" is not a proper addition to the cost of a new part but should be taken as a deduction in the year the demolition of the old part occurs. In some decisions, the Board has even held that the cost of wrecking is a deduction also. However, I think the allowance of this disbursement as a deduction will depend on the actual circumstances. Of course, you would have to apply against the unextinguished cost the amount of any salvage or scrap value.

And, when you come to the making up of your return, remember one provision of the tax law particularly. If you sustained a net loss for the year 1925, it may be applied to reduce your 1926 income, and if the income for this year is insufficient to absorb the loss, it may be taken forward and applied against 1927 income. It may not be taken forward more than 2 years, however. Thousands of concerns are entitled to use this provision but a lot of them do not know about it.

One other ruling of particular importance was recently made by the U. S. Board of Tax Appeals in a case of a foundry. It ruled that a corporation, which, through a change of business conditions, has no use for a building erected for a particular purpose, and abandons the building, is entitled to deduct from gross income in the year of abandonment the loss sustained by reason of such abandonment.

Test Kills Two Men

IN TESTING a tank for tightness of joints, two men were recently killed in Philadelphia because the tank was designed to withstand only 10 lb. The men conducting the test built up a live steam pressure of 100 lb. within the tank. A cast-iron door was blown off and the outrush of steam caused the death of two men and at the time of writing it was said that another would die. The tank was 7 ft. 5 in. in diameter, 8 ft. long, and was made of ⅜-in. steel. It is said that it was purchased second-handed.

The law was not violated in any way because in Philadelphia no city permit is required when the tank is an "unfired" vessel. Also, for the same reason, official city inspection was unnecessary.

When testing this tank, the pressure should not have been allowed to go higher than to 3 or 4 pounds because it was to have been operated at only 2 pounds. Had it been tight at 3 pounds, or even 2½ pounds, it would have been satisfactory. Extreme caution should always be exercised when turning high pressure steam into any new or previously unused vessel. If possible, do your testing with water.

—Schaphorst.

Use cast steel, rather than cast iron valves, on steam boiler work where there is a superheat of 80° or more.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Value of Reducing Turbines

I AM informed that one large paper mill is making its own electrical power for $18.10 per kw. year of 7,450 hours by passing some of its steam through reducing turbines instead of through an ordinary reducing valve. This cost is equivalent to less than one-fourth of a cent per kw. hour, or $.00243 per kw. hour, whichever you prefer.

Steam in this plant is generated at 180 lb., 50 deg. superheat. The steam is used in process work at 110 lb. per sq. in. In reducing the pressure down to this pressure it is passed through the reducing steam turbines, thereby effecting a very important saving. It is estimated that the life of the turbines will be 15 years.

In the same mill are large condensing steam units which do not serve as reducing turbines. They produce power at the cost of $75 per kw. year, or just a little over 1c per kw. hour.

It is estimated that the annual saving due to the reducing turbines is $38,000 per year. Savings of this size are surely worth while, even in the largest paper mills, being equal to six per cent interest on $633,333.33.

Modern Power Plant Efficiencies

NOT so many years ago, a boiler efficiency of 8 per cent was considered high when operating at full load and under ideal conditions. Today, however, power plant engineers are not satisfied with boilers operating at full load rating, but they run them at five times their rating and sometimes more. Thus in one instance, even at 343 per cent rating, an efficiency as high as 87.8 per cent was obtained. For twelve straight hours they operated at 530 per cent of the boiler rating. And what is most surprising they obtained a "coal rate" of 0.98 lb. per kilowatt hour. In other words, one kilowatt for one hour is now obtainable from less than one pound of coal. Also, in these days of high value of floor space they have increased the capacity of each unit of space so much that they are now obtaining six times the power from a given unit of floor space as they obtained before. Thus where they once obtained 1,000 boiler h.p. they now get 6,000, and at much higher efficiency.

Belt and Electric Cooperation

IT IS my opinion that we have seen a "vs." placed between "Belt Drive" and "Electric Drive," entirely too often. I have done it myself, but, let's not do it any more. I am a believer in both the belt drive method and the individual electric drive method —depending upon conditions. I always have believed in both.

A few years ago, while talking with a prominent manufacturer of power transmitting equipment, he told me that I was "butting my head against a stone wall" by writing articles on "Belt Drive vs. Electric Drive." He said that belting is doomed.

But he was mistaken. There is need for both electric motors and belts. During the past decade the use of leather belting has been increasing more rapidly than the use of electric motors. Both are on the increase.

When there is an increase in the use of electric motors, it often means that there is a corresponding increase in the use of belts because the motor is belted to several machines, as in group drives. And very often the motor is belted to a single machine instead of being directly connected.

In a recent advertisement by a large company who are themselves manufacturers of electric motors, they state that their belt driven machines shown in the ad. save space, give higher motor efficiency, and give improved power factor. They say this: "The increase in motor efficiency more than offsets the loss in the drive." So you see, belting AIDS electric motors. The two are not enemies.

There is no question but that the electric drive has its place—for individual drives on machines of 50 h.p. or over; on portable machines; and where overhead cranes are used. But where the power consumption is small and where there are no overhead cranes, group driving is generally more economical than individually driven machines. Individual drive "looks" better but nevertheless in many instances electric drive is better. As stated before the two are NOT enemies. That is why I shall hereafter use the words "Belt and Electric Co-operation" rather than the old "Belt Drive vs. Electric Drive."

The 208,000 kw. Unit

THERE is considerable talk throughout the world today regarding the enormous unit that is to be installed on Lake Michigan. It has already been mentioned in THE PAPER INDUSTRY. The total weight will be about 4,000,000 pounds. The weight of the heaviest part will be 275,000 pounds. It will generate 63 per cent as much power as the entire Niagara Falls Power Company. Two tons of coal will be burned every minute, and during that same time 400,000 gallons of cooling water will be circulated from Lake Michigan and back into the same lake.

Four million pounds is heavy, of course, but in volume it is surprisingly small. A 20-ft. cube of solid steel would weigh four million pounds, and out of

that amount of metal a unit is made that will develop over 200,000 kw., or 279,000 h.p. A team made up of 279,000 horses, one behind the other, allowing only 10 feet per horse, would be 528 miles long. Allowing 1,200 pounds per horse, such a team would weigh 335,000,000 pounds as compared with the 4,000,000-pound turbine unit.

I am informed by what should be a reliable source of information that "the cost of maintaining a horse, which includes feed, labor in caring, depreciation of horse, harness, shoeing, etc., varies from $150 to $250 per year." In this fashion it is very interesting to compare the old-time methods with the new. The advances that have been made are difficult to comprehend without basic comparisons of this sort. What is more, I have given the horse the advantage in the above figures because the average power developed by a draft horse when worked at a normal rate is only ¾ h.p. Using the animals themselves as prime movers, the cost per h.p., including the total cost of maintaining the horses, is 20c per h.p. per hour. Contrast that with the lower power rates now being enjoyed from power stations all over the world.

Steam Plants Use Diesels

THE DIESEL engine is now being used to some extent in large steam power plants for standby purposes. Thus where the boiler, engine, or turbine cannot take care of the overload, the Diesel engine handles the peak. An advantage of the Diesel is that it can be started more quickly than boilers can be fired. There is no delay.

The steam end of the plant is further assisted by the Diesel engine in that the exhaust from the Diesel is utilized for heating the boiler water. In one instance the exhaust from the oil engine brings the temperature of the feed water up to about 300 deg. Fahr. This means a fuel saving of about 8 per cent because each eleven degrees increase in temperature is equivalent to a saving of one per cent.

Repair Parts

IT IS not uncommon for manufacturers to get letters from users of their products, damning the manufacturer for not having repair parts in stock, regardless of the part that needs replacing or repairing.

This is an unfortunate circumstance that can hardly be avoided where the machine is of special character or where it is a machine developed in the process of evolution to a standard perfected type.

In the paper machinery field, as well as elsewhere, where rapid progress is being made, the design today is often just a little different from that of yesterday, so that in the course of a year or more the total change is very marked, the latest type sometimes losing all resemblance to the first.

The only thing that can be done in making renewals in cases of this kind, then, is to refer back to the drawings and remake the piece or pieces. If patterns are still in stock and if the piece is a rough casting, it is not very difficult to make the repair, but where considerable machining must be done the repair is usually expensive.

To be sure, where the machine is standard there is little excuse for the manufacturer not having repair parts in stock. Usually our best manufacturers do keep such parts in stock.

Users should bear this in mind: If you buy a "new" machine, one that has just been put on the market, you are liable to have troubles of this kind. If you buy a standard, well-known machine you are safer.

However, I am not knocking the new machine or the special machine. They are often the best obtainable for one's specific purpose.

Square Roots

THIS very simple scale gives the square root or square of any number without the necessity of doing any figuring and without looking up tables.

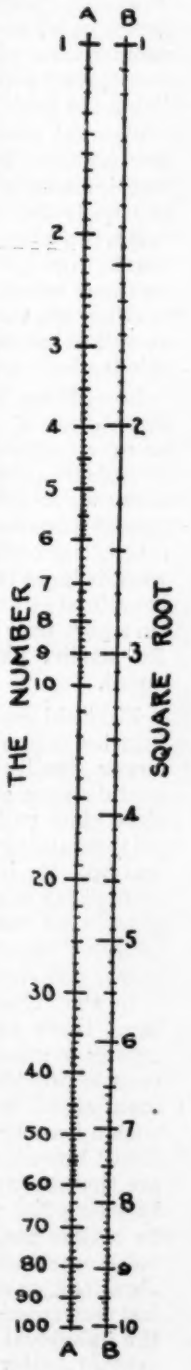
For example, what is the square root of 64? Find 64 in Column (A) and the square root, which is 8, is shown just opposite in Column (B).

Inversely, how much is 3x3? Find 3 in Column (B) and the square, 9, is given in Column (A).

If you want to know the square root of 300, look opposite the 3, because there are two more digits in 300 than in 3. If you want to know the square root of 3,000, the answer is to be found opposite the 30 for the same reason—there are two more digits in 3,000 than in 30.

The scale, therefore, tells you that the square root of 300 is about 17.3 and that the square root of 3,000 is about 55.

When adding two digits to Column (A), one digit must be added to Column (B). And when subtracting two digits from Column (A) one digit must be subtracted from Column (B). With these facts in mind it is obvious why you can square any number and extract the square root of any number whether it is a whole number or a decimal. Thus the square root of .04 is 0.2 and the square root of 0.4 is 0.63. Just a minute's study and the scale can be mastered by anybody.



Editorial Comment

By WILLIAM SIBLEY

Keeping Employees Healthy

THE spirit of an employee may be willing but it availeth little if the flesh is weak. Individual efficiency in industry depends on the development and maintenance of sound minds in sound bodies, and many progressive firms have adopted plans for supervising the health of the personnel.

Physical examinations prior to employment are now required by several large organizations. This practice assures the selection of workers who will be physically able to keep up production as well as prevents the placing of men with poor vision, weak hearts, contagious diseases and other disabilities in positions where these defects may result in injury to either the worker or his fellows. From an economic as well as moral standpoint it is imperative that only able-bodied men be employed.

In addition to the initial examination, periodical inventories of the worker's health are conducted by an ever increasing number of firms. One company re-examines the important members of its personnel every six months, although in the majority of cases, annual examinations are considered sufficient. The cost of such physical examination, if the volume of work is large enough to justify a full-time physician, is estimated at something less than $1.00 per man. On a part-time basis, which is the usual arrangement for smaller plants, this cost is proportionately reduced.

First-aid equipment for the treatment of minor injuries is found in almost every plant. Some of the larger institutions provide individual hospitals, dental offices, and similar features, while the medium sized plant will arrange for such services on the outside, retaining only a trained nurse at the first-aid station. Such arrangements and "medical departments" far more than pay their way by keeping employees at work. The continued production so provided naturally reflects to the benefit of both employee and employer.

In the "Central Manufacturing District" of Chicago, there has developed a unique arrangement among a group of small industrial plants whereby each is provided with medical assistance at a minimum cost. In this group of plants a good doctor, with a leaning toward industrial practice, has established himself on a "syndicate" basis. His "clients" are the companies and each pays him a retainer's fee based on the number of men employed. In return he makes periodical visits to each shop, doing the usual work of examining teeth, eyes, throats, skin abrasions, or making physical examinations and medical recommendations either to the management or to the individual men. His office is located in the convenient center of this group of plants so that he is constantly on call by any one of them in the event of an emergency. Such an arrangement provides small plants with expert assistance at small cost, and enables the physician to keep constantly in touch with upwards of 400 men from whom can be developed a reasonable private practice. So mutually advantageous is the plan to all concerned that the companies frequently are permitted to lower the retainer fee after the first year or two, if they so desire.

Keeping healthy employees healthy is the second phase of the problem. For this purpose recreational activities such as are developed by community clubs, athletic associations, and the like, are excellent allies. Under proper guidance these activities supply the workers with wholesome outdoor and social relaxation that tends to eliminate the oppression that is especially noticeable in plants where specialized operations require the worker to turn out the same product or part day after day, with little or no variation.

In some industries, rotation of jobs has been found advantageous. As an example, an employee whose duties cause him to be exposed to excessive heat, fumes or gases, can be detailed to perform other work that will occasionally bring him to the outdoor atmosphere. Such shifting is of course impossible in some plants.

Annual vacations are usually granted to clerical employees. Of late years this practice has been extended by many firms to include other classes of workers. One large Eastern machine shop grants vacations with pay to all shop men. A large packing house gives all workers (employed continuously for one year or more) a week's vacation with pay. A large garment manufacturer advocates vacations with pay to day workers, and vacations without pay to piece workers. Several concerns award two weeks' vacation with pay to all whose attendance records have been perfect for 50 weeks.

Doing everything possible to keep employees healthy is both a dollars and a sense proposition.

Where They Would Come From

WRITING in another place, we recently made the statement that the United States was, in the minds of countless thousands both here and abroad, the greatest and most desirable country on earth. Upon seeing the statement a friend challenged the assertion by saying that while we as Americans naturally have an abounding pride in our own country, recent events have so turned other nations against us that our flattering ideas are not seconded by many who live across the waters. That our friend is dead wrong is proved by figures collected by the State Department from our many consuls stationed through-

—— on Timely Subjects

out the world. These figures show the relation in the number of persons seeking passport visas with the number allowable under existing immigration laws.

The outstanding fact is that from countries where the allowable immigration is less than 170,000 more than 1,600,000 would come here to live. The greatest demand for permission to enter this country is found in Italy where 500,000 want visas when the consul can only fill the quota of 3,845. In Czecho-Slovakia there are 250,000 who wish to come to the United States notwithstanding the fact that only 3,077 are permitted under our present laws. The quota from Poland is 5,982 but there are more than 250,000 who wish to come.

More than 200,000 "unspeakable" Turks are anxious to come to the United States. The quota for Turkey is 100. This is one of the surprising features of the recent survey for it will be remembered that from Turkey immigration was almost negligible before the war. Syria, with a quota of 100, has 20,000 on the waiting list. Roumania has a quota of 603, with over 15,000 to fill it. Greece has 7,500 candidates for its predetermined quota of 100.

Great Britain and all the Scandinavian countries are prepared to send more than the allowable quotas, but in the Irish Free State, France and Germany, the number of applicants is below the established quotas. Germany, for instance, has a quota of 51,227, but the applicants number only about 16,000.

When it is seen that our present immigration laws are stemming the flood of southern and southeastern Europeans, we realize the benefit of that law. America is in no such need for workmen that she must sacrifice good citizenship to get them. The statistics are significant in that they show what would happen to this country if it were not for our restrictive immigration laws. If there must be a change in our existing laws, as some of radical tendency assert, we will agree—but that change must be only to make the walls of restriction still higher.

Water Power

THERE is available in the United States a potential total of 34,818,000 h.p. of water power 90 per cent of the time, and 55,030,000 h.p. available 50 per cent of the time. Of this potential hydro-power from natural sources, 10,100,000 h.p. has already been developed. This total of developed water power represents an increase of nearly one million horsepower over the total development as of one year ago. Of the past year's increase in hydro-power development, 99 per cent has been developed by public utilities, only a scant 1 per cent, or approximately 9,500 h.p., has been developed by manufacturing plants.

Because the Pacific states possess the greatest potential water power of any geographical section of the United States (21,260,000 h.p.) the development in the west, totaling 2,336,400 h.p., is the greatest sectional development. New England, however, has done more than any other section to develop her natural water power sources, since the total developed horsepower is 1,398,803 of a potential 1,978,000 h.p. Next in order comes the Middle Atlantic states with an actual development of more than two million horsepower out of a potential 5,686,000 h.p. The South Atlantic states, however, are not far behind, with their development of 1,600,000 from an available 4,400,000. It is in the mountain states that the greatest percentage of water power is still being wasted—due, largely, to limited consumer demand. In this section there is available more than 15,500,000 horsepower, of which only a scant one million has been developed.

The mechanical development of more efficient power transmission lines and equipment, thus making it possible to transmit electrical energy without excessive loss, would lend impetus to the development of the mountain water power, now being wasted. The engineer solving the problem of efficient power transmission will be of incalculable benefit to mankind and net for himself both fame and fortune.

Things Worth Knowing

A history file should be maintained for every piece of equipment. Starting with a 5x7 card when the item is received and installed, every inspection and repair should be completely recorded on this card, thereby providing a valuable history of the service of such equipment. This data will prove of great assistance to the plant executive at a later date when replacement equipment is being considered, or when plant additions are being contemplated.

HERE is something that sounds impossible, but, according to an engineer friend of ours, is quite practicable.

Not infrequently the glass front of a meter will get shattered with the result that unless the "face" is promptly replaced the meter will suffer impairment by reason of the ingress of dirt and dust.

When a new glass front is unobtainable on short notice, take an ordinary piece of single strength window glass—and cut it to the desired shape with a pair of common scissors. Merely cut out of cardboard the shape desired; hold this pattern on to the glass, then, with the pattern, the glass, the scissors, your hands, and all under water, the glass can be readily shaped by a gradual snipping process.

Southern Supers Hold Meeting

THE Southern Division of the American Pulp and Paper Mill Superintendents' Association, held a most enjoyable and profitable meeting on Friday and Saturday, November 19th and 20th, 1926, at Bogalusa, La. Superintendents, chemists, mill managers and other executives from pulp and paper mills in Louisiana, Mississippi and Texas, were present with a number of representatives of machinery and supply houses. Chief Forester J. K. Johnson, of the Great Southern Lumber Co., Dr. Paul M. Horton, Associate Professor of Chemistry, Louisiana State University, and Mr. John Traquair, Chief Chemist, Mead Pulp and Paper Co., Chillicothe, Ohio, were also present as guests of the Bogalusa Paper Co.

The convention began with a tour through the plant of the Bogalusa Paper Co., followed by a luncheon at the Pine Tree Inn. The business meetings took place in the lecture room of the Bogalusa Paper Co., and there were about sixty people present. In the absence of the chairman of the division, R. H. Laftman, who, with Mr. W. H. Sullivan, vice-president of the Bogalusa Paper Co., were obliged to be in Houston, Texas, on important business, the meeting was in charge of R. E. Hartman, manager of the E-Z Opener Bag Co., Braithwaite, La., vice-chairman.

Election of Officers

Following the reading of the minutes, announcements and telegrams, the following officers were elected unanimously for the ensuing year: Chairman, R. E. Hartman, E-Z Opener Bag Co.; 1st vice-chairman, O. J. Oleson, Louisiana Paper Co.; 2nd vice-chairman, Alex Nadeau, Southern Paper Co.; 3rd vice-chairman, B. Beasley, Brown Paper Mill Co.; secretary-treasurer, R. H. Stevens, Bogalusa Paper Co.

Mr. Hartman, in expressing appreciation of the honor conferred on him, urged every member of the division to take an interest in the association and participate in what it was trying to do. He reminded the members of the expense to which the various companies are put in sending so many men away from the mills to attend meetings. In doing so, he said, they expect the men to bring home ideas of merit to their mills, and the only way this can be done is by free and liberal exchange of ideas.

A letter was read from John A. Bowers, Hammermill Paper Co., Erie, Pa., who is chairman of the Committee of Pulp Mill Superintendents, urging enlistment of more members in order to strengthen the organization and permit expansion of its activities. He also proposed that the division express itself in favor of the extension of financial support by the national organization to the proposed employment of a full time man by the Committee on Vocational Education of the American Pulp and Paper Association.

Foreman Training

R. L. Eminger, national secretary, then spoke on foreman training work in the state of Ohio. He said that there is a federal appropriation available for this purpose which is apportioned among the states according to magnitude of manufacturing industries. In Ohio, the state university handles the funds and has recently completed a book which is offered for sale at cost—one dollar. This training work is different from the course which makes use of the textbooks of the Committee on Vocational Education. While admitting that the latter were admirably adapted to study by the technical man, Mr. Eminger criticized them as being too technical for the average mill employee. The sentiment of the meeting was in favor of encouraging the type of foreman training work suggested by Mr. Eminger.

Critical Study of the Southern Pine Fiber

A paper was then presented and read by Secretary Stevens, which had been prepared by Mr. T. H. Nilsson, an American-Scandinavian, Foundation exchange student who has been working in the laboratory of the Bogalusa Paper Co. for about two months on the subject of "A Critical Study of the Southern Pine Fiber." The paper was in the nature of a preliminary report of work in progress and was presented for discussion and criticism only. Briefly the work reported on showed:

1—Contrary to theories generally prevalent, there does not seem to be any marked difference in the proportion of length to diameter of fibers of the southern pines as compared with northern conifers.

2—The wall-thickness of the southern pine fibers is much greater in proportion to the length of the fibers than in the case of northern conifers.

3—The percentage of late-growth fibers (summer fibers) appears higher for the southern pines than for the northern conifers. This fact contradicts statements made by European technologists and was presented tentatively subject to possible revision, if future investigation should fail to support the fiber measurements thus far made.

4—Pulp made from "early wood" (spring growth) of the southern pine has greater bursting strength, but lower tearing strength, than that made from the "late wood" (summer growth).

5—In general, less beating is required to attain maximum strength in the pulp from "early wood."

6—The "early fibers" are more easily fibrillated, but also more easily cut or broken in beating or jordaning than the "late fibers."

7—The "late fibers" yield stronger fibrillae than the "early fibers," but are harder to fray out at the ends.

From these facts it was concluded that the well known differences in southern kraft and northern kraft are due to the thicker fiber walls and greater percentage of the "late fibers" in the southern pulp.

Reforestation of Great Southern Lumber Co.

J. K. Johnson, head of the reforestation department of the Great Southern Lumber Co., Bogalusa, was the next speaker on the program and he gave a most interesting description of the problems besetting forest conservation in the South and the activities of his company in overcoming them.

Mr. Johnson remarked that the possibilities of the paper industry in the South is mainly responsible for the activities of the Great Southern Lumber Co. in forest conservation.

This company started six years ago in a small way to see what could be done about growing timber on its cut-over land. On appraising the situation, it was found that the greatest immediate task was that of creating a condition which would permit the trees to grow. First of all, the chief enemies of tree growth had to be overcome, chief of which was public opinion, which sanctioned annual burning of the grass that new green grass might spring up for the cattle that roamed at large; sanctioned an antiquated tax system, and placed more value upon hogs running wild in the woods than upon millions of pine seedlings. For the reason that trees could not be grown to maturity, questions involving tree species, soil adaptabilty, growth analysis, yield, crop rotation, etc., had to wait.

We were obliged to become forest educators as well as practical foresters, Mr. Johnson said. Through the local newspapers, circulars, lectures in public schools, demonstrations and exhibits at local fairs, it had to be shown that the prosperity of the South depended upon bringing idle lands into production, and that the latter was impossible in the face of forest fires and unjust taxation.

In the meantime, the Great Southern Lumber Co. started in 1920, a fire patrol to cover a few thousand acres. This has since been extended until last season in Washington Parish contiguous to Bogalusa, they patroled 220,000 acres and succeeded in stopping 200 fires which altogether did not burn more than 15,000 acres. During these last six years, they have planted by hand 14,000 acres of pines. Careful selection of seed trees to be left in the cutting and protection from fire is resulting in rapid restocking of the land by natural means.

Co-operation with the forestry division of the State Department of Conservation and Federal authorities in having placed upon the statute books of Louisiana good forestry laws, has today brought Louisiana into the ranks with foremost states of the Union in progressive forestry legislation. During November, an amendment to the State constitution was unanimously adopted to permit young forest trees to grow to maturity before being placed upon the assessment rolls for an annual ad valorem tax.

An extensive study of the rate of growth of the common

conifers has just been completed over a region of about 75 miles radius around Bogalusa. As a result, ideas have been obtained regarding yield, soils and adaptability of species. From the information which the company will obtain from the survey of all their forest land, they expect to work out a program for continuous cropping with maximum yield at minimum cost.

Mr. Johnson remarked that the great question of the permanence of the supply of raw materials should very properly be made a part of the regular program for superintendents' discussion.

Following the announcement by Mr. Eminger, national secretary, that the National Association had secured Mr. Edward R. Hunter, secretary of the Wood Utilization Committee, to address the next annual convention at Richmond, on May 26th, 27th and 28th, 1927; the meeting was adjourned.

Banquet

An informal banquet was held in the Pine Tree Inn tendered by the Bogalusa Paper Co. Mr. Townsend, sales manager of the Great Southern Lumber Co., was prevailed upon to say a few words of welcome on behalf of Mr. Sullivan, who was absent. Mr. Townsend made some very witty remarks, saying, however, that it was hard for a native to talk on any subject except Bogalusa. An orchestra rendered many popular selections as well as some old time airs in which everyone joined in vocal chorus. A three-reel film from Bastrop, La., was shown and the diners dispersed in a jolly good humor.

Saturday's Session

The second session of the meeting was turned over entirely to discussion, Chairman Hartman asking for full and frank discussion by everyone, and that no one need feel he must rise and address the chair as in a formal meeting. He started the ball rolling by asking if any of the pulp mill men had any problem they would like to discuss. J. M. Murray, pulp mill superintendent of Bogalusa, asked how long the mills continue to boil in their causticizing tank, remarking that one superintendent had told him it was better not to boil at all.

Bogalusa Paper Co. keeps the steam on and agitator running for thirty minutes, then pump up to settling tank. Calcasieu Sulphate Paper Co. does not use any steam in their causticizers.

E-Z Opener Bag Co. uses a settling tank four times as large as causticizing tank, adds lime in the latter and pumps out immediately to the settling tank where they boil and agitate until full; i.e., until four batches have been accumulated. This takes about four hours.

Southern Paper Co. does not have separate tanks for settling and for causticizing. They add the lime in basket in the settling tank and use enough steam to bring up to boiling, after which they shut off the steam.

F. M. Dodge, pulp mill superintendent of the Southern Paper Co., stated they found that if a dissolving tank has stood full of fairly strong green liquor over Sunday and is then pumped first on Monday morning, that tank always settles more slowly and contains more sludge than the next tank, or any that follow, which are made with fresh smelt. He asked if anyone else had noticed this and if they knew the cause and the remedy.

Louisiana Pulp and Paper Co. finds that their liquor settles just about as good on Monday as at any other time. They attribute such differences to variations in the lime. They asked the question, "What lime do you use?"

Southern Paper Co. uses Cheney lime. They have tried other limes and have found that some will boil up quickly while others are more slowly slaking. Cheney lime is moderately slow, about 25 minutes.

The Brown Paper Mill Co. have observed that if cold liquor from the pit is siphoned into the dissolving tank, that tank of liquor settles more slowly.

Mr. Dodge, of the Southern Paper Co., said that perhaps drawing down the smelter Sunday morning brings some slag or something from the smelter that affects the settling of the liquor. If they pump out Sunday morning, however, the liquor settles all right, but if it stands over Sunday, before causticizing, it does not settle well and they get more sludge.

The next question was put as to what disposition is made of woodroom screenings, to which the E-Z Opener Co. and the Louisiana Co. replied they were using it in the smelter. All the others send it to the boiler room, except Brown, who burn it with the bark in a waste burner.

Active Alkali Per Ton of Pulp

The next question was, "What is the active alkali per ton of pulp?" The answers ranged from 550 lbs. to 660 lbs. When all were figured to the same basis, however; i.e., pounds Na_2O per ton, it amounted to nearly the same in each case.

Quality of Saltcake

The question regarding quality of saltcake was next raised. Yellow Pine reported having tried 2 cars of 65% Na_2SO_4. Brown had some that went as low as 78% to 82%. E-Z Opener reported having tried low grade saltcake on a price differential but found it cheaper in the long run to use only high grade saltcake.

Fineness of grinding of saltcake was the next question for discussion. J. E. Whittfield, chief chemist Brown Paper Mill, said the reduction was lower from very fine saltcake than from that ground about the size of a pea because more of it was carried up the flues. Louisiana Co. reported more unreduced saltcake when using larger size. Calcasieu reported they were using all degrees of fineness mixed and have not been running long enough to observe marked differences. Southern Paper Co. uses only the size of a pea.

Stevens Explains Chemistry of Saltcake Reduction

Upon the request of Mr. Hartman to outline briefly the chemistry of the reduction of saltcake in the furnace and to suggest how this could be affected by fineness of grinding, Mr. Stevens, of Bogalusa, said: "I think we all understand that the carbon of the black ash unites with the oxygen of the saltcake forming carbon monoxide and leaving sodium sulphide. Fineness of grinding should assist this reaction by bringing about more intimate admixture of the sodium sulphate with the carbon particles. Now, of more importance than particle size, provided the latter is within reasonable limits, is the matter of oxygen supply; i.e., air pressure and rate of flow of air through the nozzles. The reduction of sulphate to sulphide can obviously take place in stages and might conceivably stop with the sulphite, or there may be re-oxidation of the sulphide back to the sulphite or even as far as the sulphate again if there is too much air."

Following more discussion about pulping problems, Chairman Hartman suggested it was time to give the paper machine man a chance to discuss their problems.

Paper Machine Problems

H. C. Carter, paper mill superintendent Yellow Pine Co., asked if anyone was having trouble with markings from the suction roll at the suction press. None seemed to have such trouble except Bogalusa when running an old felt; after the first week or 10 days it begins to show. E-Z Opener Co. have found that in changing felts and press rolls, when changing from wooden top roll to soft rubber roll, they get away from the difficulty.

Mr. Carter said he thought perhaps their trouble was that they get the sheet too dry on the first press because the wooden roll cracks.

To the question of how many are using wooden rolls on first press, Bogalusa, Yellow Pine and Southern Paper Co. answered in the affirmative; Louisiana Pulp and Paper Co. was the only one using granite rolls; Brown Paper Mill, Calcasieu Co. and E-Z Openers are using rubber rolls on first press.

O. G. Squires, of Shuler and Benninghofen Co., then made a brief statement regarding design of felts, outlining what he thought would overcome this difficulty wherever experienced.

Mr. Hartman stated that in his mill, the E-Z Opener Co., they had made up felt and wire costs and would be glad to exchange information with any other mill which would care to write for it.

Old and New Wires in Retaining Water

The question was asked whether a wire retained more water when it is old than when new. Few seemed to have record on this except Southern Paper Co., who have noticed that they use more water on a new wire; E-Z Opener Co. think

they get in trouble when they run a wire too long, say eight or ten weeks. Their wires run from 6 to 68 days.

The question of souring the wires to get more drainage was discussed, and J. M. Brouillet, Bogalusa superintendent, said that if done carefully it is an advantage and does not shorten the life of the wire. They use 5 gallons of 14 Be muriatic acid to dilute in a 52-gallon barrel.

Dr. Abrams, chemist of Bogalusa, suggested that the filling up of the wire may be due to accumulation of slime by excessive re-use of white water. This brought the subject of save-alls up, which, however, was not discussed exhaustively.

Size and Alum Per Ton of Paper

J. O. Richardson, superintendent E-Z Opener Co., asked what amount of size and alum are being used per ton of paper in the various mills. It was suggested that all figures be converted to 70 per cent basis for comparison. Results were as follows:

Brown Paper Mill Co., 30 lbs. size—110 lbs. alum.
Louisiana Pulp & Paper Co., same as Brown Paper Mill.
Bogalusa Paper Co., 14 lbs. size—27 lbs. alum.
Calcasieu Paper Co., 20 lbs. size—40 lbs. alum.
Southern Paper Co., 20 lbs. size—35 lbs. alum.
E-Z Opener Bag Co., 18 lbs. size—47½ lbs. alum.
Yellow Pine Paper Mill Co., 55 lbs. size—80 to 85 lbs. alum.

Discussion on Board Machines

Chairman Hartman asked if there were any questions to be asked on board machines, to which J. J. Morrall, board mill superintendent of Bogalusa Paper Co., stated he had one question and that was regarding the pitting of calender rolls. He said that they are having a great deal of trouble in this regard. Mr. Eminger said that similar trouble was being experienced in many mills in the North and that the only suggestion he could ever get was that the rolls should be reground. Mr. Eminger related of his visit to the plant of the Lobdell Co., where he found that it was a practice to chill and polish all size rolls the same, contrary to the belief in the minds of some that larger rolls were not as well chiseled as the small rolls. The Lobdell people offered to make any possible investigation and to go into the matter fully, but thus far they only recommend that the roll be taken out and reground. The Farrell people made a similar statement.

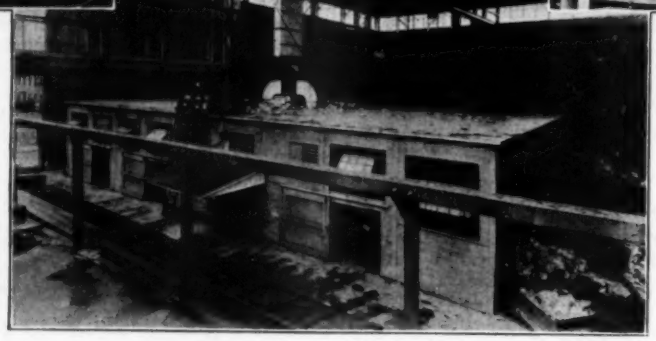
Arthur Zimmerman, assistant manager Charles Boldt Paper Co., New Iberia, La., stated they had not had to regrind a roll in 5 years. In reply to whether they were running water boxes on their calenders, he said that they were, and that they were using kraft sulphate pulp from Bastrop and Louisiana Pulp and Paper Co. Mr. Stevens suggested that the trouble seemed to be worse in mills that were making their own pulp and wondered if it might be possible that there was something in fresh pulp.

Time Set for Next Meeting

It was then decided that the next meeting would be held in New Orleans approximately six months from date, but that the exact time should be left for the executive committee to determine. The meeting was then adjourned.

Combined Warehouse and Beater Room

BOARD mill men will be interested in the accompanying pictures of the layout of the paper storage warehouse and breaker beater room of the Standard Paper Company, of Kalamazoo, Mich. The Standard Paper Company has taken full advantage of modern industrial methods to secure for itself a commodious stock room for old papers, economical means of handling the bales and an adequate breaker beater room that is clean, spacious and is very well ventilated.



One photograph shows the paper storage shed with the breaker beater room in the foreground. In the background are shown the bales of paper which have been placed in a pile by one of the two two-ton Shaw cranes. These cranes are operated electrically with the control located in a cab built on to the crane. The shed is of steel beams and trusses with a sheet steel covering. The floor of the shed is made of concrete.

The breaker beater room is of tile construction. Note the ventilating system for the breaker beater room rising from the center of the roof. The pipes by which the pulp is sent to the beater room of the mill are also seen rising from the roof of the breaker beater room. Another view shows the interior of the room. In the foreground is one of the two hoods which carry off the vapor which rises from the beater as the old paper is reduced to pulp. In a gap in the floor, just below the hood, the pulp in the beater may be seen. The beater is located so that the top of the sides are level with the floor. The entire beater is covered over except for two of these gaps, one at each end. These gaps are the points at which the old paper is fed into the beater. This is a regular Shartle installation, and the room contains, in addition to the beater, a riffler for taking out foreign matter and a battery of thickeners for thickening the stock prior to its being pumped to the paper mill proper.

The cleanliness and neatness of the whole installation, as well as the excellent ventilation of the breaker beater room, should be noted.

The third picture of the group shows the movable platforms which were devised to meet a special condition in connection with the unloading of the old paper stock. There is only a single spur track on which a single shunt a day is available. The space opposite the doors of the beater room is used for loading finished paper out of the mill finishing room. The movable platforms run down alongside a long string of cars and the incoming bales of old papers are unloaded on to the platforms which are then run up to the storage shed and unloaded.

In many ways, the situation at this mill in regard to the railroad facilities and the location of the mill buildings is peculiar and this peculiarity necessitates arrangements which would not be necessary elsewhere. However, the spaciousness of the warehouse, in which lightness of structure is combined with solidity and performance, the modern methods of handling, the neatness and ventilation of the breaker beater room, will be of interest to all board mill men.

Rosin Sizing*

R. UZAC

ROSIN is the non-volatile residue remaining after the steam-distillation of spirits of turpentine from gum turpentine. It consists of isomeric acids having the formula $C_{20}O_{30}O_2$ together with about 5 per cent of neutral compounds about which little is known and which are collectively designated as resenes.

Owing to its acid properties, rosin can combine with oxides of the metals to give salts, or resinates. The resinates of the alkalies, or rosin soaps, are soluble in water, while the resinates of the heavy metals and of the alkaline-earth metals are insoluble in water but soluble in most of the organic solvents.

Rosin Soaps

The rosin soaps are more or less viscous, watery pastes, the ammonia rosin soaps being the only ones which are hard like the fatty acid soaps. The consistency of a rosin soap containing 25 per cent of free rosin (the rosin soaps used for sizing paper contain some unsaponified rosin) decreases as the water content increases from 40 to 60 per cent. At 60 per cent the soap becomes more consistent and loses its transparency: if it is allowed to stand for several months there separates a clear transparent upper layer and a lower layer containing the excess of acid soap. These free-rosin soaps are acid to phenolphthalein, but their aqueous solutions turn pink owing to the hydrolysis which takes place.

Rosin soap has strong detergent properties: Hillyer[1] studied the surface tension between soap solutions and kerosene. In the case of a decinormal aqueous solution of rosin soap, this tension is only about 5 to 6 per cent that of water.

The hydrolytic dissociation varies with the concentration and temperature of the solutions, increasing with the dilution. A. Haug[2] investigated this dissociation electrochemically, and I have summarized his results in the following table:

Concentration of the Solution	Rosin Liberated by Hydrolysis: In Pure Water		Neutral Soap in Solution of	
	Neutral Soap	Soap Containing 25% Free Rosin	0.65 g. NaCl per l.	1.25 g. NaCl per l.
0.1 N	6%	33	5	3
0.05 N	10%	36	8	5
0.02 N	24%	40	18	11
0.01 N	50%	56	28	17
0.005N	70%	60	40	23
0.001N	95%	50	55	28

This dissociation accounts for the alkaline reaction of aqueous soap solutions. The turbidity of the solutions is due to the free rosin which is held in suspension.

Is the dissociated rosin really free? McBain, Laing and Taylor[3] found that the particles in suspension in sodium palmitate solutions had the formula HR.2NaR (where R stands for the acid radical). Kraftt and Stern[4] find that, as the dilution increases, the particles tend to the composition $NaHR_2$. They operated by extraction of the soap solutions with toluene.

I carried out this extraction in the case of hundreth-normal soap solutions. The extract was washed with water, and then analyzed, and gave the following neutrality numbers[5]:

Alkaline soap 0.12
Acid soap (25% free rosin).....0.10

Kraft's and McBain's formulas correspond to neutrality numbers of 0.50 and 0.66, respectively, so that the product liberated by the dissociation of rosin soap is much more acid than the one obtained by dissociation of fatty soaps.

Sizing of Paper

Rosin is used chiefly for sizing paper. The soap is added to the stock after the latter has been beaten or refined, and it is decomposed by means of sulphate of alumina. The precipitated rosin is fixed on the fibers and prevents the paper from absorbing the ink. The relative proportions of size and of sulphate of alumina must be such as to give a slightly acid back water at the paper machine. Thiriet and Delcroix[6] have determined the optimum pH: it is the one at which the back water gives the same color with sodium alizarin sulphonate and with methyl red, which have inverse color changes.

Much has been said, of late, about colloidal rosin. Dr. Lorenz[7] states that he has succeeded in dispersing rosin with the Plauson colloid mill and that he sized paper with the dispersion thus obtained. Unfortunately, in an address at Manchester on March 13, 1925, J. Melrose Arnot[8] stated that the Plauson Mill and Filterpress Limited had refused to give him a sample of this emulsified rosin as the results obtained with it had not proved satisfactory. Dr. Ostermann has constructed an apparatus similar to a conical refiner, and rotated at a high speed. The pulp and lump rosin are passed through it together: the rosin is thus ground and intimately mixed with the pulp, and it is fixed to the latter by addition of sulphate of alumina. It is claimed that a good sizing is thus obtained with 1 per cent of rosin.

For my part, I have succeeded in sizing paper with rosin that had been merely powdered very finely but in order to obtain satisfactory results twice as much rosin was required as when rosin soap was used.

Certain authors, along with Lorenz[7], consider that no resinate can be formed in the beater on account of the high dilution of the size: the various reagents are completely hydrolyzed and free rosin and hydrated alumina are precipitated.

On the other hand, Neugebauer[9] precipitated a solution of 2.5 grams of sodium resinate in 1,000 cc. of water by means of a 5 per cent solution of aluminum sulphate and found that the precipitate consisted of a mixture of rosin and of resinate. His results are summarized in the following table:

Grams Sulphate of Alumina per 100 Grams of Rosin	Free Rosin in the Alcohol-Soluble Portion of the Precipitate	% Aluminium in the Alcohol-Insoluble Portion of the Precipitate
50	31	3.8
100	32.1	4.0
200	33.8	4.1
400	41	5.2

According to Haug's table the dissociation of a solution of 2.5 grams of neutral soap per liter should liberate 55 per cent of the rosin: the percentages of free rosin found by Neugebauer are thus lower than would theoretically be expected.

I worked with even more dilute solutions, 1.5 grams per liter, which corresponds to sizing stock at a consistency of 5 per cent with 3 per cent of rosin. I precipitated the rosin with 3 grams of sulphate of alumina (with 18 molecules of water of crystallization), which also corresponds with the amount of alum generally used in paper mill practice. The precipitate obtained in this way was filtered rapidly, dissolved in benzene, and the solution was filtered and titrated. I found neutrality numbers of 0.65, 0.60, 0.55 and 0.70.

By using the same method as Neugebauer, I found in the neighborhood of 40 per cent of free rosin. After removing the free rosin from the precipitate by washing with alcohol, the residue was dissolved in benzene and was found to have a neutrality number of 0.94, 1.12.

The formation of aluminium resinate is thus clearly proved. But in addition there is also formed basic resinate, which is almost completely insoluble in benzene and in ether. After the precipitate obtained above has been freed from free rosin by washing with alcohol, if the residue is dissolved in boiling benzene the basic aluminium resinate remains as white insoluble flakes. If the whole precipitate is boiled in benzene, without previous washing with alcohol, transparent clots are formed, instead of the white flaky precipitate, and they rapidly spread through the whole mass and make it set to a jelly.

The formation of this jelly interferes with the proper investigation of these precipitates: it prevents the separation of the resinate from the hydrated alumina (which may have

*Translated from *Revue Générale des Colloïdes*, iv, 257-262, September, 1926, by A. Papineau-Couture.

[1] Journal of the American Chemical Society, 1903.
[2] Wochenblatt für Papier Fabrikation, Nos. 1, 4 and 5, 1923.
[3] Third Report on Colloid Chemistry, London, 1920.
[4] Berichte, 1894, 1895, 1896, 1899.
[5] I designate as "neutrality number" the ratio of combined resin acids to total resin acids, or, more precisely, the ratio of the rosin equivalent to the metal oxide to the total rosin acid. The method of analysis is given in Chimie et Industrie, August, 1925.
[6] IIIième Congrès de Chimie Industrielle, Paris, 1923; IVième Congrès de Chimie Industrielle, Bordeaux, 1924.
[7] Papier Fabrikant, No. 4, 1923. Zellstoff und Papier, No. 1, 1923.
[8] Paper Maker and British Paper Trade Journal, April 1, 1925.
[9] Zeit. f. angew. Chem., vol. xxv., p. 2155.

been formed) by filtration and does not allow a detailed study to be made of the precipitate.

If the precipitate dries it becomes partially insoluble, and the dry resinate causes the formation of jelly only after standing for 8 to 10 days in the solvent.

The jelly can be prepared simply by contact between a solution of rosin and a precipitate of hydrated alumina; but it is not formed if the alumina precipitate has been dried, which naturally leads to the supposition that the rosin reacts with the alumina when it is fresh, i. e., when it is in the state of a gel. I tried to make rosin and alumina combine by heating them together: after two hours at 300 degrees C. very little combination had taken place, and analysis showed only traces of combined alumina.

Since a rosin solution can combine with hydrated alumina, it is quite natural to wonder whether the difference between the amount of free rosin found by Neugebauer in his precipitate and the amount which would be expected from the dissociation of the soap might not be due to a combination of the precipitated rosin and alumina. Sieber had indeed observed that colloidal hydrated alumina could fix a small amount of rosin, but he had considered this fixation to be merely a matter of adsorption.

I prepared: on the one hand, a rosin precipitate by addition of a slight excess of dilute sulphuric acid to a very dilute solution of rosin soap so that the solution was acid to methyl orange; on the other hand, hydrated alumina by addition of a slight excess of caustic soda to a solution of aluminium sulphate, which I then made slightly acid again by adding more sulphate of alumina.

The mixture of the two precipitates is slightly acid to litmus. After standing for 24 hours, the still moist precipitate gave the following results:

Alcohol solution (free rosin), 9 cc. normal NaOH.

Benzene solution (combined rosin), 4.5 cc.

It is thus seen that one-third of the rosin has combined to form aluminium resinate. As a matter of fact, there may be even a higher proportion of combined rosin owing to the almost complete insolubility of the basic resinate which would remain with the alumina. It is seen, therefore, that the use of free rosin instead of rosin soap would result in the formation of a certain amount of aluminium resinate.

The precipitate of more or less combined rosin and alumina is in the form of a very stable and unctuous paste. Contrary to rosin precipitates, which agglomerate as soon as the temperature is raised, the rosin-alumina precipitate remains in the same state even when the solution is boiled, which would indicate that the rosin no longer is in the free state, but probably is in the form of a colloidal rosin-basic resinate complex. I have even heated it to 150 degrees C. in the oven for one hour without melting the rosin.

Paper can be sized quite well by means of this precipitate, and the latter could be used in paper mills; but its cost would be slightly higher than that of the soap, and in addition the latter must give a better distribution of the rosin, which is partly in the colloidal state and partly in a molecular condition.

Sizing Tests with Powdered Rosin

Paper can be well sized by means of colloidal rosin, prepared by pouring an alcoholic solution of rosin into water, in presence of sulphate of alumina or of sulphuric acid. But such a preparation is not stable, and with a relatively slight increase in temperature the rosin particles coalesce and give a viscous precipitate.

I have tried to size paper with powdered rosin. Very smooth and even pastes can be obtained with a ball mill; but it is necessary to have hydrated alumina present. With rosin alone, or in presence of soda, soap, or sodium aluminate, the particles of rosin soon adhere to the balls and to the wall of the mill and it is utterly impossible to grind it. The paste obtained in presence of hydrated alumina is unctuous and oily, and emulsifies quite readily with water. I prepared in this way a paste which I passed through a 120-mesh sieve. Sizing tests showed that in order to obtain equivalent results twice as much rosin was required in this form as in the form of soap. There is no doubt that better results could be obtained by more prolonged grinding of the rosin; but in that case the mechanical dispersion of the rosin would be as expensive as its chemical dispersion.

Finally, suspensions obtained by pouring an alcoholic solution of acid sodium resinate into water give as good results as the rosin soap itself.

The following table gives comparative results obtained by floating on the same ink papers which had been sized in different ways. In order to obtain comparable sheets, I took the same weight and volume of stock and poured it on a mold with a high deckle.

Sizing Agent—	% Rosin to Stock	Time Required for the Ink to Pass Through the Sheet
Rosin Soap	2.5	1 hr. 40 mins.
Powdered Rosin (120-mesh sieve)	2.5	54 mins. (in spots)
Powdered Rosin	6	1 h. 30 m. (in spots)
Precipitated Rosin + Alumina	2.5	1 hr. 20 mins.
Acid Sodium Resinate	2.5	1 hr. 25 mins.

Effect of Drying on Sizing

Edwin Sutermeister[10] and Paul Klemm[11] have shown that the degree of sizing increases in the course of the drying. According to Klemm, under the action of heat the fine rosin particles soften and coalesce at their points of contact to give a continuous film over the surface of each fiber. This seems rather difficult when alumina, and consequently aluminium resinate, is present, since we have seen that the precipitate which we prepared could be heated to 150 degrees C. without melting or coalescing (it decomposes without having melted at about 300 degrees C.). And in order to accept Klemm's theory it would be necessary that the precipitate should coalesce without melting, since fats and waxes, which would melt under these conditions, are not suitable for sizing paper.

I am more inclined to believe that the increase in temperature favors the formation of the basic resinate and of its colloidal complex with the remaining free rosin. For, in order that the degree of sizing may be increased by heating, it is necessary that the sheet should be moist: an air-dried paper on heating will give only a transient increase in degree of sizing, due to its increased dryness. Now, we have seen that dry alumina does not combine with rosin and that the dry basic resinate does not form a colloidal complex with free rosin.

Conclusions

The fixation of rosin by the stock can quite readily take place without the use of sulphate of alumina: it is merely a question of having the proper reaction of the medium.

Paper which has been sized without alumina loses its sizing in a short time, which shows that alumina is essential. When sized paper is treated with alcohol the free rosin is removed, and at the same time the degree of sizing is reduced, which proves that free rosin also plays a part in sizing.

But we have seen that alumina and rosin combine together and that the resultant compound forms a colloidal complex with free rosin. It is therefore natural to believe that this complex is formed on the paper; and as R. Sieber[12] has shown that cellulose can retain considerable quantities of hydrated alumina, it can be supposed that a cellulose-rosin-alumina complex is formed, cellulose itself being a colloid. We thus have a new colloid, and the surface tension between this new colloid and the ink is much lower than the surface tension between the ink and the original cellulose.

Schwalbe has brought forward the theory that alumina formed a sheath around each particle of rosin to prevent its oxidation, oxidized rosin, according to him, being incapable of sizing paper. This theory can be discarded, for I prepared a soap from powdered rosin which had been standing in the air for three years, and this soap gave me exactly the same results in sizing as ordinary rosin soap.

[10] Chemistry of Pulp and Paper Making.
[11] Wochenblatt für Papier Fabrikation, No. 22, 1922.
[12] Zellstoff und Papier, Nos. 1, 3, 5, 7, 1921, and No. 5, 1922.

It was with profound and deep regret that the many friends of Mr. Benjamin Mendelson, president of the Mendelson Bros. Paper Stock Co., learned of his death on Thursday, November 18. Mr. Mendelson was a prominent and respected figure among paper stock dealers.

Notes in Connection with the Rules Governing Contestants in The Paper Industry Annual Safety Contest, Beginning January 1, 1927

(See Page 1485)

1—The average number of employees should include clerical and office as well as manufacturing employees. To obtain average, count names on payroll and salary roll for each pay day during period. Add these totals together and divide by number of pay days involved. For example:—4 pay days in November—600 names on pay roll of November 6,—700 on November 13,—500 on 20th, and 800 on 27th. Total of these = 2600. Divide this by 4 (No. of pay days) = 2600 ÷ 4 = 650 (average number of employees).

2—If possible report actual number of hours worked, from payroll. **(Include** clerical and office as well as manufacturing employees.) If payroll figures are not available, proceed as follows:—Assume plant employing 650 operates factory with 600 employees 50 hours per week for 52 weeks, and office with 50 employees 45 hours per week for 50 weeks. Then total hours worked for the year by all employees would be (600 × 50 × 52) + (50 × 45 × 50) or 1,672,000 hours.

3—Count only those accidents which cause death, permanent injury (such as loss of finger, etc.), or loss of time beyond the remainder of the day or shift during which the accident occurred. No matter what time of day the worker may be injured, if he returns to his regular job at the start of his next regular shift, the accident is not counted. If, however, he does not return, the accident is counted as a Lost Time Accident.

4a and 4b—For deaths and permanent injuries, use the number of days specified in the table below. This table represents the **total** charge for any such accident; **the actual time lost must not be added.**

4c—For temporary injuries, count the actual days lost, excluding Sundays. For the purpose of comparison, holidays and Saturdays should be counted as full days. For example:—A man is injured some time Monday, November 1, and returns to his regular job at starting time, Tuesday, November 30. Twenty-four days is the number to be charged against this injury, regardless of whether the rest of the crew worked Saturday afternoons, Sundays, or Thanksgiving, or were laid off at any time on account of bad weather or any other cause. **Charge all lost time to the period in which the accident occurred.** For example, if an accident occurs on Dec. 1, 1925, and the man does not return to his regular job until Jan. 15, 1926, then all of his lost time must be included in the 1925 report. Use doctor's estimate, if necessary.

5 and 6—The rate calculations will be made by the staff of the National Safety Council if desired.

SCALE OF TIME CHARGES FOR DEATHS AND PERMANENT INJURIES

List Here Number of Accidents of each kind	Nature of injury	Degree of disability in percent of permanent total	Days lost
	Death	100	1,000
	Permanent total disability	100	1,000
	Arm above elbow, dismemberment	75	750
	Arm at, or below elbow, dismemberment	60	600
	Hand, dismemberment	50	500
	Thumb, any dismemberment of	10	100
	Any one finger, any dismemberment of	5	50
	Two fingers, any dismemberment of	12½	125
	Three fingers, any dismemberment of	20	200
	Four fingers, any dismemberment of	30	300
	Thumb and one finger, any dismemberment of	20	200
	Thumb and two fingers, any dismemberment of	25	250
	Thumb and three fingers, any dismemberment of	33⅓	333
	Thumb and four fingers, any dismemberment of	40	400
	Leg above knee, dismemberment	75	750
	Leg at or below knee, dismemberment	50	500
	Foot, dismemberment	40	400
	Great toe, or any two or more toes, any dismemberment of	5	50
	One toe, other than great toe, any dismemberment of	0	....
	One eye, loss of sight	30	300
	Both eyes, loss of sight	100	1,000
	One ear, loss of hearing	10	100
	Both ears, loss of hearing	50	500

Injuries not involving amputation should be rated as a proportion of the number of days charged to the entire loss of the member involved, in accordance with the degree of impairment. The charge in days for impairment of function of any member should be such percentage of the charge in days for dismemberment as may be determined by the local compensation authorities in fixing the compensation for such impairment, i. e., if loss of a hand is compensated by 150 weeks' indemnity, then an impairment of the hand for which 75 weeks' compensation was paid should rate as one-half of the loss of the hand in the above scale, or 250 days lost.

Hernia should be included only as a temporary disability on the basis of the actual time lost.

WHY PAINT . . .

every year or two?

Some of the greatest plants in American Industry avoid frequent repainting. Here are the facts. They may save you thousands of dollars.

LAST year more than twenty million dollars was spent on paint for industrial interiors. And a large part of it went to cover up soiled paint only a few months old!

Yet many of the greatest plants avoid frequent repainting—and are kept spotlessly clean and light for years—by painting their ceilings and walls with washable Barreled Sunlight.

The photographs at the right show how Barreled Sunlight is able to effect this great economy. Here is a paint finish so smooth it offers dirt no foothold, and can be washed like tile—and so durable that repeated washings will not wear it away.

Moreover, Barreled Sunlight *retains its lustrous whiteness.* Made by the exclusive Rice Process, it is actually guaranteed to remain white longer than any gloss paint or enamel, domestic or foreign, applied under the same conditions.

Barreled Sunlight cuts labor cost in painting jobs. It is an all-oil product, therefore flows freely and can be applied by brush or spray, *at the lowest cost per square foot of surface covered.* It is guaranteed not to flake or scale if properly applied.

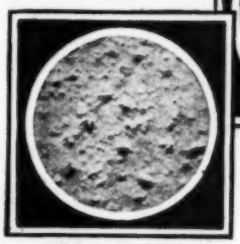
Barreled Sunlight is sold in 55- and 30-gallon churn-equipped steel drums, and in cans from ½ pint to 5 gallons. Where more than one coat is required, use Barreled Sunlight Undercoat first.

Use the coupon to obtain interesting illustrated booklet and a painted sample of Barreled Sunlight.

U. S. GUTTA PERCHA PAINT CO.
Factory and Main Offices
2 Dudley Street, Providence, R. I.
New York—350 Madison Ave. Chicago—659 Washington Blvd,
San Francisco—156 Eddy Street
Distributors in all principal cities

Ceilings and walls painted with Barreled Sunlight can be washed like tile—instead of repainting!

Barreled Sunlight



Ordinary Flat Finish White Paint

THE MICROSCOPE SHOWS WHY BARRELED SUNLIGHT WASHES SO EASILY

The above photographs of white paint were taken through a powerful microscope. Each paint was magnified to the same high degree. The astonishing contrast shows why Barreled Sunlight is so easy to keep clean. Its surface is smooth, even and non-porous. It resists dirt and can be washed like tile.

U. S. GUTTA PERCHA PAINT CO.
2 Dudley Street, Providence, R. I.

Please send us your booklet "More Light," and a panel painted with Barreled Sunlight.

Name .....

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City ..... State .....

THE RICE PROCESS WHITE

Barreled Sunlight
Reg. U. S. Pat. Off.

NEW YORK CITY NEWS

Gair Company Purchases Mill

According to an announcement made by Robert Gair, Jr., from the executive offices of the Robert Gair Company, at 350 Madison avenue, New York, a few days ago, that company has purchased the Paper Board Corporation, of Tonawanda, N. Y. The paper board mill heretofore owned and operated by the latter company in Tonawanda will become a part of the Robert Gair chain of board mills and will be operated under the name and direction of the Gair Company, effective immediately.

The Paper Board Corporation formerly was the Tonawanda Division of the Beaver Board Companies. The Tonawanda mill is a large one, having a capacity of about 300,000 pounds of paper board daily and equipped with two machines, one of 110-inch and the other of 132-inch trim. It has been manufacturing board of various kinds, including chip and news, folding box board, lined news and chip, patent coated board, test board and chip for corrugating.

The Aldine Paper Mills, Inc., of which Harry E. Goldberg is president, have leased the entire ground floor and basement, approximating 20,000 square feet of floor room, in the new Hudson-Charlton Building at 333 to 339 Hudson street, New York, and in the near future will move from their present quarters to the new location. The company now has offices at 1270 Broadway, and a warehouse at 541 West Thirty-fourth street, New York. The new quarters have been leased for a term of years. In the new quarters the offices and warehouse of the company will be consolidated.

Alfred Bloch Forms New Firm

Alfred Bloch has resigned as manager of the Mill Supply Department of the Maurice O'Meara Company, of 448-452 Pearl street, New York, and has organized a new firm under the name of Alfred Bloch & Co., with offices at 358 Fifth avenue, New York, telephone Wisconsin 1692 and cable address "Wasteblock" New York. Mr. Bloch in his new company will deal in foreign and domestic papermaking materials, including rags, waste paper, bagging and wastes. Mr. Bloch is widely known in the trade and to paper manufacturers. He was with the Maurice O'Meara Company for 14 years, for 12 years as assistant manager and for the last two years as manager of the Mill Supply Department of that concern, and previously he was for six years with Daniel M. Hicks, Inc., of New York. He therefore has had over 20 years' experience in the paper stock trade.

An announcement by the Maurice O'Meara Company states that Mr. Bloch has the heartiest good wishes of that concern for success in his new undertaking, and that in the future its Mill Supply Department will be in charge of William O'Meara, vice-president of the company.

Frank E. Dunaway, pulp dealer and mill agent of 52 Vanderbilt avenue, New York, has been appointed sole distributor in the United States of the various products manufactured by the Fez Company, Ltd., of Vienna, Austria, including papermakers' felts and wires. The Fez Company is the most prominent European manufacturer of felts, jackets and paper and pulp machine wires. One of its products of a specialty character is an asbestos drying felt, which has found very extensive use among foreign mills. Mr. Dunaway will, of course, continue to handle wood pulp the same as in the past.

The Pascal Paper Company, of New York, was incorporated under New York State laws recently with a capital of $15,000 to deal in paper. J. Pascal, J. Kontex and H. Sederos were the incorporators.

Lexington Now Not Vanderbilt

Owing to a readjustment of telephone exchanges in New York, the telephone numbers of several offices in the Grand Central district have been changed from the previous names of Murray Hill or Vanderbilt to Lexington. The New York office of THE PAPER INDUSTRY has in this way been given the new telephone number of Lexington 0357, and the American Paper and Pulp Association, The Technical Association of the Pulp and Paper Industry and affiliated organizations are now listed as Lexington 4502.

Among the recent elections to membership in the Merchants' Association of New York are the Waterfalls Paper Mills, Inc., of 200 Fifth avenue, A. Olafsen, president and treasurer, and the Steiner Paper Corporation, of 50 Franklin street, Carl Steiner, president.

The Penn Fiberboard Corporation, manufacturer of test liners for corrugated and fiber boxes, folding box boards, chip board, felts and mill wrappers, with mills in York, Pa., has opened a New York sales office in the Canadian Pacific Building, 342 Madison avenue.

Harry W. Draudt has severed his connection with H. Hollesen, Inc., wood pulp importers of 17 Battery place, New York, and now is associated with the pulp department of Parsons & Whittemore, Inc., of 299 Broadway, New York. The latter concern recently announced that after January 1 next it would have the sales agency in this country for the well-known Koenigsberg and Norddeutsche brands of German pulps, and Mr. Draudt will continue to offer these pulps to paper manufacturers.

As announced previously, the Sharp Paper and Specialty Company, Inc., of New York, has been organized to conduct a general import and export business in paper and specialties. The company was formed by Bernard Sharp, who recently resigned as export manager for the Republic Bag and Paper Company, of New York, to embark in business on his own behalf. The Sharp Company has offices at 200 Fifth avenue, New York.

The Battenkill Mills, of Utica, N. Y., have been incorporated under New York State laws with a capital of $10,000 to manufacture box board and wood pulp. B. E. Crouse, T. Burgess and C. R. Dewey were named as incorporators.

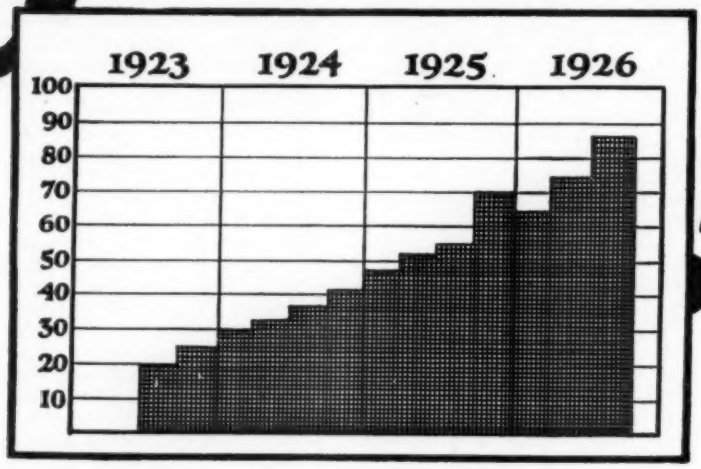
Frederick W. Westlake

Much grief was felt in New York paper trade circles over the sudden death on November 11 of Frederick W. Westlake, vice-president and treasurer of the Perkins-Goodwin Company, paper and paper mill supplies dealers, of 33 West Forty-second street, New York, which occurred in the Polyclinic Hospital following an operation for appendicitis. Mr. Westlake had been apparently in excellent health, but suffered a sudden attack of appendicitis and was rushed to the hospital three days before his death, where the operation was performed immediately. Peritonitis set in, however, and Mr. Westlake died on Armistice Day.

Mr. Westlake was widely and popularly known among paper and pulp men. He was born in Toronto on July 16, 1876, and after graduating from the public schools in that city entered the employ of the Canadian Pacific Railroad, where he served as an auditor several years before coming to New York. He first was employed about 20 years ago by the Perkins-Goodwin Company as cashier, and following a number of progressive steps became treasurer and later vice-president and director of that company. He also was treasurer of the Tidewater Paper Mills Company, a director of the Citizens' Savings Bank and a trustee of the Polyclinic Hospital. He was a member of many clubs, including the Union League, Metropolitan, Uptown, Sleepy Hollow, Garden City Golf, Riding and Driving of Brooklyn, Baltusrol Golf, Pine Valley Golf, Fox Hills Golf, and the Congressional Country Club of Washington, D. C., and the Royal Montreal Golf Club. He also was a member of the St. John's Lodge of Free and Accepted Masons.

Funeral services, which were attended by many of the deceased's friends in the paper trade, were held in St. Paul's Church in Brooklyn, where Mr. Westlake lived at 197 Ocean avenue. The body was taken to Tornoto for interment and

Growth!



Significant to every user of ROSIN SIZE

for PAPER

FOUR years ago Rosin Size appeared in the long list of Kalbfleisch Chemicals. A long felt need was met—as proven by the charted increase in our Rosin Size business.

Two factors have influenced this phenomenal growth . . . the feeling on the part of manufacturers that they need a quality size . . . and their appreciation of the engineering service we gladly offer.

The practical aspects of the DeCew Sizing System appeals to paper makers. We also sell Size without System, where it is the desire of our customers to continue their present methods.

May we tell you about both?

The
KALBFLEISCH
Corporation

200 Fifth Ave., New York

FACTORIES:

Erie, Pa. Brooklyn, N. Y. Kalamazoo, Mich. Elizabeth, N. J. Chattanooga, Tenn. Waterbury, Conn.

private services at the home of his parents there. A widow survives.

Arthur D. Clough

Arthur D. Clough, sales manager and assistant treasurer of the New York and Pennsylvania Company, with executive offices at 200 Fifth avenue, New York, was killed in an automobile accident on the evening of November 11, when the car in which he was riding collided with another automoible near the town of Du Bois, Pa., while he was on a tour of inspection of the company's mills, en route from Lockhaven to Johnsonburg, Pa. Mr. Clough had been with the New York and Pennsylvania Company for 36 years, having entered into the service of that company when it was organized in 1890. He is survived by a widow and two sons, one of whom, Richard Clough, is also with the New York and Pennsylvania Company, and the other, C. W. Stuyvesant Clough, sales manager of the Alling & Cory Company, paper jobbers. Funeral services were held from the Clough residence in Garden City, L. I., on November 14.

NORTHERN NEW YORK NEWS

Dreegle Takes New Post

James Dreegle, who for the past 20 years has been associated with the International Paper Company, has arrived in Carthage to assume his new duties as superintendent of the West End Paper Company. Mr. Dreegle will fill the vacancy caused by the resignation of J. W. Smith, who was forced to give up his work on account of ill health.

Mr. Dreegle comes to Carthage from Ticonderoga, where he acted as superintendent of one of the International mills at that place. He was formerly in the mill at Niagara Falls, which was closed at the outbreak of the war. The West End company will soon begin the manufacture of ground wood specialties.

Herring Plant Now Operating

Operation of the Herring plant of the Taggart Brothers Co., Inc., which was purchased from the St. Regis Paper Co. in the spring of 1925, has been started. The mill, which is fitted to manufacture paper bags, has been undergoing the process of reconstruction since last July.

The plant, when operated at full capacity, will employ 80 men and about 100 women. A high-speed cylinder machine of a capacity of 300 feet a minute has been installed for the making of light weight paper for cement bags. Some time ago, the Taggart Brothers Co. changed its process of bag manufacturing that involved using a lighter weight paper and the Herring mill was converted to its uses. The big machine at the Herring plant will produce about 25 tons of jute paper bags a day.

Arrangements have been made for temporary storage space for 15,000 to 20,000 tons of pulp at the port of Albany next spring. Increased imports of wood pulp are expected to be brought to Albany. Officials of the port of Albany have been in conference with pulp brokers who are anxious to import wood pulp through Albany.

Seeking Lower Freights to Chicago

In an effort to secure lower freight rates upon paper products, representatives of the National Paper Products Co., of Chicago, have appeared before the interstate commerce commission involving the New York Central. The hearing marked the first in the fight to obtain lower rates for shipments to mid-western points. The Continental Paper and Bag Corporation has also presented a freight reduction claim against the New York Central for shipment of similar articles to the same territory. Several arguments were presented to set forth reasons why the rate should not be reduced seven and one-half cents a hundred.

J. A. Quinlan, traffic manager of the St. Regis Paper Co., has returned to Watertown from Chicago, where he attended the hearing of the case of the Tonawanda Paper Co. against the New York Central and the case of the Ontario Paper Co., Ltd., against the Canadian National Railway Co. The St. Regis Paper Co. was granted the right to introduce testimony. The complaints were directed specifically against the rates on newsprint and printing paper to Chicago.

Fire of unknown origin broke out in the Natural Dam mill of the Oswegatchie Paper Co. last month. The blaze started in the dryer pit and considerable damage was done.

Burns Brothers & Haley, of Watertown, have completed the erection of a new sulphite plant for the Algonquin Paper Corporation in Ogdensburg. Machinery is now being installed. It is expected that the plant will be ready for the making of sulphite about the middle of December.

The Sisson-White Co., of Potsdam, will haul 18,000 cords of pulpwood this winter cut on the Litchfield park near Tupper Lake. Cutting was completed early this summer and the wood is peeled and is ready for the hauling season. The wood will be driven down the Raquette river to Piercefield, where it will be used by the International Paper Co.

Reforestation in New York

Conservation Commissioner Alexander McDonald, in his annual report, says that 20,481,112 trees were distributed from the state nurseries for planting this year. Last year the number was slightly over 10,000,000. The total plantings for 1926 equaled those of 1924 and 1925 combined and is more than the total plantings from 1901 to 1914.

About one-fourth of this year's plantings was done by the state and three-fourths by municipalities, schools, industrial concerns and individuals. The Otsego county board of supervisors has voted $50,000 for reforestation work to be spread over a period of ten years. The program calls for the purchase of waste and abandoned lands and their planting.

Negotiations have just been completed whereby three of the large buildings of the Phoenix Mills, Inc., of Little Falls, become the property of the Little Falls Fibre Co.

High water in Black river during the early part of November caused some trouble to the paper mills.

John E. Grimshaw, of Carthage, aged 59 years, was instantly killed by falling down an elevator shaft at the mill of the National Paper Products Co., at Carthage.

An interesting account of the new paper mill development at Corner Brook, Newfoundland, is contained in a book published last month by the Century Company, which is entitled "The Great Island." The author, Don C. Seitz, is an experienced writer, having been for many years connected with the **New York World** before he became associate editor of **The Outlook.** Several views of the new village of Corner Brook, the mills and the Humber River are shown by means of process plates of remarkable beauty.

New Ball Bearing Vibrating Screen

The Link-Belt Co., of Chicago, Philadelphia and Indianapolis, have brought out a new ball bearing vibrating screen which is said to be simple in construction and yet possessing adaptability to almost any fine screening condition.

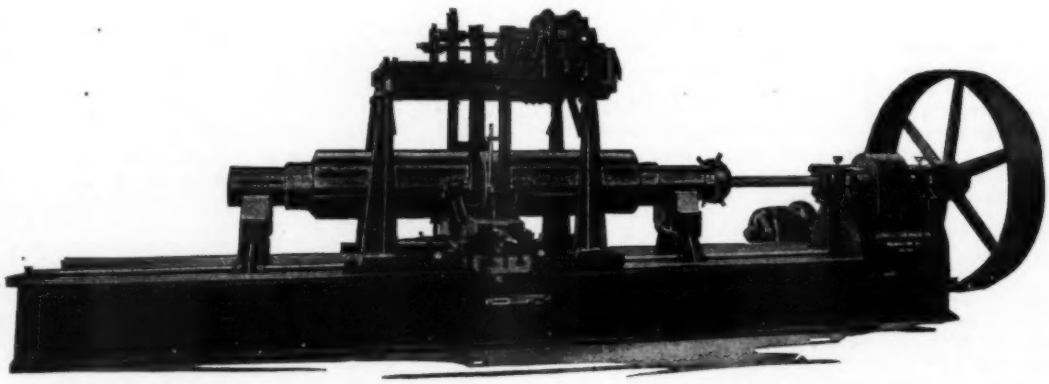
The screen is a mechanically operated device and has only one moving part which rotates in large, oversize ball bearings. The vibrator has no cams, springs, striking blocks or levers to adjust or renew. It consists simply of a shaft, driven at suitable speed from any common source of power. This shaft, thrown out of balance by adjustable counterweights, imparts vibrations to the screen box upon which it is mounted, and these in turn are transmitted to the screen cloth secured, under tension, in the box.

There are five standard sizes ranging from 2' x 5' to 4' x 8', and each can be furnished with one or two screening surfaces, giving a wide application for materials of varying sizes and capacities.

LOBDELL

ROLL GRINDERS

are reducing the cost and time required to keep their rolls in perfect condition in over 60 paper mills in the United States, Canada and abroad.



THE automatic crowning device and the provision for leveling the bed are features found only in LOBDELL Roll Grinders. They reduce the time of grinding, increase the accuracy, and prolong the life of the machine. They are fully illustrated and described on page 371 of the Pulp & Paper Mill Catalog and in our booklet on the Grinding, Care and Upkeep of Paper Mill Rolls. Write for your copy.

Lobdell Car Wheel Company

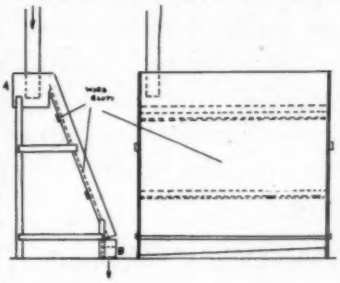
Wilmington, Delaware

Established 1836

Practical Helps for the Mill Man

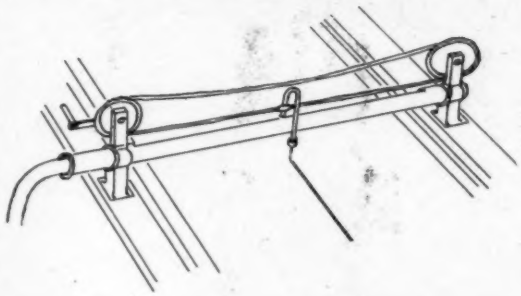
A Side-hill Save-all or Inclined Screen Save-all

A SUPERINTENDENT recently revealed that he had been much interested in seeing a "side-hill" save-all in another mill and that he had introduced it in the place of some obsolete equipment in his own mill. If this piece of paper mill equipment was news to this man perhaps it is to others. The device is very simple. Old paper machine wire or new wire if desired can be used to cover a frame some twelve feet wide and twenty feet long. This frame with its wire covering is set up at an angle of from 45 to 60 degrees with the horizontal. A trough for white water is provided at the top and the trough is so arranged that the white water will overflow onto wire cloth. The water drains through the screen and the pulp runs down to a trough at the bottom. This arrangement is not recommended in comparison with the various efficient save-all systems now on the market. For a mill which has some out-of-date equipment and has not yet decided on the type of save-all to buy could use this device for a time. The saving made would readily convince them of the desirability of going a step further in waste reclaiming.



Controlling the Squirt

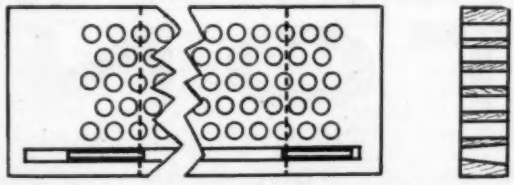
A MEANS of controlling the squirt on the wire so that its progress across the wire is steady is provided by the set of sheaves shown in the sketch. A wire it attached to the



squirt pipe so that it will move it in either direction. This wire is passed over the sheaves and spliced so as to be endless. There is a handle on the sheave on the front side and this is used to move the squirt across the wire more evenly than can be done by pushing on the hose.

A Slot in the Suction Box

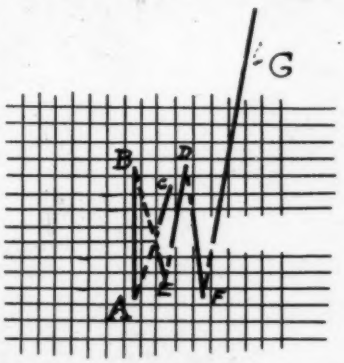
A SUPERINTENDENT who saw a recent item about a groove in the suction box from hole to hole in the last



row of holes nearest the couch press says that a slot in place of the last row of holes with the groove is better. The sketch shows this arrangement. In order not to lose suction where the slot crosses the heads in the suction box, a block is provided at each end of the suction box. This block slides in the slot and is placed so that the suction will not be lost where the slot crosses the suction box head. The block must be long enough to extend outside of the wire so that it may be adjusted if the deckle is shoved in. The dotted lines in the sketch show the approximate location of the suction box heads and the placing of the blocks in reference to them.

Securing the Ends of a Crack in the Wire

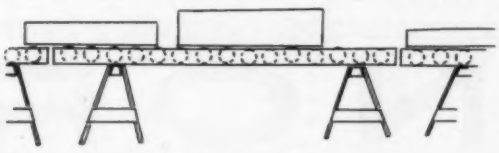
THE following suggestion is offered by a boss machine tender who was noted, not only for the speed with which he could sew a crack in the wire, but also for the length of time the sewing endured. The accompanying diagram indicates the wires of the fourdrinier wire by the fine criss-cross lines. The heavy diagonal lines represent the sewing wire. The papermaker quoted ascribed some of the endurance of his sewings to the fact that the crack seldom opened up beyond the ends of the sewings. This was due to the fact that he sewed from both ends of the crack toward the middle. Taking a piece of sewing wire, this man inserted the end of the wire in the mesh



(A) and hooked just a short end (C) out through the crack, leaving it there. The long end he inserted again at (B), hooked it out through the crack and went on to (E) and so on to the middle of the crack. Then he took a new piece of sewing wire and started at the other end of the crack, making a similar pattern and working to the center of the crack again, when he finished up. By making his start at both ends in this way, the part (A B) of the sewing wire could be set over sometimes three or four meshes onto the unbroken part of the wire at both ends. This prevented anv tendency for weakened warp wires to give way and start the crack running out into the good part of the wire. In addition, this boss machine tender always claimed that if he sewed a whole crack with a single wire the wire was so worn when he was through that it was of no use anyway. On a long crack, this man would take three or even four lengths of sewing wire, using two of the lengths to secure the crack at each end as shown.

Consider the Roller Conveyor

USERS of pulpwood who are using power conveyors, either to bring the wood from remote parts of a wood pile to a central conveyor or from a car to a pile or in any way whatsoever, should consider the possibility of letting gravity do some of the work with roller conveyors as shown in the sketch. By using short lengths of roller conveyor and horses and taking advantage of available slopes, the power to operate short lengths of power driven conveyor might be saved.



CONTINUOUS OPERATION in the production of ground-wood is economy. Tie-ups, because of the necessity of changing pulp stones mean losses never to be regained. The Norton Pulp Stone has proven in actual performance reliability not limited by weeks or months, but carrying on into years.

NORTON CO. Worcester, Mass.

NORTON

Grinding Wheels
Grinding Machines

Refractories-Floor and Stair Tiles

NEW ENGLAND NEWS

Brown Company Opens Boston Office

One of the most interesting of recent events in New England was the opening of offices in Boston by the Brown Company, of Portland, Me., mills of Berlin, N. H. Years ago the Brown Company maintained small offices in this city but for a long period have allowed their sales representatives from other offices to cover New England. Believing it to be mutually advantageous for them as well as their customers to have a sales center in closer contact with the trade the local division was decided upon. Offices have been opened on the 11th floor of the Chamber of Commerce Building, Boston. They are in charge of Dr. Richard L. Rice, former manager of the Pacific Coast division of the Brown Company at San Francisco. Dr. Rice will have the entire sales of the New England states under his control and it is understood that a northern section of New York state will also be covered from the Boston office.

Assisting Dr. Rice will be sales heads for pulp, chemicals, and paper. Mr. W. L. Gilman will have charge of the pulp sales, including Alpha fiber, as well as the famous Brown Company sulphites. Mr. E. C. DuPont will be in charge of chemical sales. Assistant to Dr. Rice in the office management is E. O. Hanson. Commodious quarters have been leased, private offices for each department being provided, besides general offices. There is no question that the New Hampshire manufacturers have gone into their Boston office with the intent of making it first class both as to personnel and to physical equipment.

Incidentally, the new 200-ton mill of the Brown Company at Berlin, an addition to their Burgess plant, although built independently of it, has been delayed somewhat in the last stages of its construction, but will probably be in operation during December. This additional 200 tons is to be entirely Alpha fiber, the new pulp with which the Brown Company is invading the field that was thought to be safely held by rags alone. It is at present impossible for the Berlin, N. H., manufacturers to supply the demand for Alpha, even at the advanced price of 6 cents per pound.

New Arrangements on Nibroc Bond.—Before leaving the subject of the Brown Company another development in connection with their products and affecting their New England sales agencies was announced about the first of December. Instead of selling Nibroc, their sulphite bond, through a large number of merchants, the merchants handling it have been cut to five. In Portland, Me., and Manchester, N. H., this will be C. H. Robinson & Co.; in Boston, John Carter & Co., and the Charles A. Esty Paper Co. will sell and stock Nibroc; the Esty Company, whose main offices are at Worcester, will also carry it there; in Providence The Paddock Paper Co.; and in Bridgeport, R. M. Houston & Sons will be the distributors. The paper will also be stocked by John Carter & Co. at their Hartford offices and, of course, can be bought from their offices at New Haven, Providence, Springfield and Concord, N. H.

The Millers Falls Paper Co., of Millers Falls, Mass., have brought out a new line of paper called Journal Linen Ledger, a high grade medium priced ledger stock.

Boston Paper Trade Holds Fall Meeting

The Boston Paper Trade Association held their annual fall meeting at the Exchange Club, Boston, Wednesday, November 17th. The usual fine dinner was served, music by Walper's Orchestra making it the more enjoyable.

A brief business session presided over by Norman Harrower, of Linton Bros., Fitchburg, president of the association, received applications for membership from George J. Cadwell of the American Writing Paper Co., and Dexter D. Coffin of C. H. Dexter & Sons, Inc., of Windsor Locks, Conn., and for associate membership from Col. F. L. Thompson, formerly of Moore & Thompson, Vermont paper makers, now of New York. All were unanimously elected.

The speaker for the occasion was Major F. A. C. Forbes-Leith, R. A. S. C., whose record-making journey in a 16 h. p. auto from France to India has enabled him to talk most interestingly of those ancient countries of Persia, Beluchistan, Asia Minor and the Balkan states through which he wended his way. Profusely illustrating his remarks with lantern slides, he made the evening most entertaining and instructive.

Upon conclusion, President Harrower announced a nominating committee including John E. A. Hussey, International Paper Co.; C. L. Baird, Baird & Bartlett; C. S. Proctor, Proctor Paper Co.; C. A. Esty, and John W. Vivian, Cook-Vivian Co. Their job is to prepare a slate of officers to be voted on at the meeting in March.

Appointment of a publicity committee and a membership committee to make a drive for new members are among the active steps taken by the New England Paper Merchants Association under their new president, C. A. Esty. The Association held its annual election last month and elected besides Mr. Esty, First Vice-Pres., M. O. Byrne; Second Vice-Pres., A. C. Hall; treasurer, E. A. Eaton; Secretary, F. H. Blackman; Auditor, A. H. Arnold. The Executive Committee includes the above and R. M. Stone, S. C. Burgoyne, W. E. Porter and Carleton Knight. Representatives to the National P. T. A. include W. B. Stevenson and A. W. Blackman for fine and wrapping papers, respectively.

Postpone Sale A. W. P. Co.

New developments involving foreclosure of the mortgage by the Old Colony Trust Co., of Boston, against the American Writing Paper Co., have forced postponement of the public sale which was to have taken place at the Windsor Lock Mill on December 2. The United States District Court of Massachusetts has now ordered the sale to be held on December 27th at Holyoke. President S. L. Willson was prepared to go through with the sale on December 2nd, but was unable to do so. The sale itself is technical, according to all reports, and is made for transferring legally the assets to the new corporation which has been organized with the approval of the various committees, representing bondholders, preferred and common stockholders, merchandise creditors and noteholders.

Mr. Willson, appointed special master for the sale, has been ordered to accept no bids lower than $80,000 for the Unionville property, $50,000 for the Manchester, Conn., and $250,000 for the Windsor Locks, Conn., properties. The total amount for all the mills shall not be less than $3,650,000.

New Executive Engineer for A. W. P. Co.

Loss of their head engineer by the American Writing Paper Co. has at last been filled by a most capable executive. He is L. C. Reynolds, who will function for the A. W. P. Co. as executive engineer. He has had a wealth of engineering experience which should serve him well in Holyoke, where the big company has several varieties of power manufacture and a number of real power and engineering problems. He has had extensive experience with the General Electric Co., in charge of their Long Island City plant, with the General Motors Corp., and with the New York Central R. R.

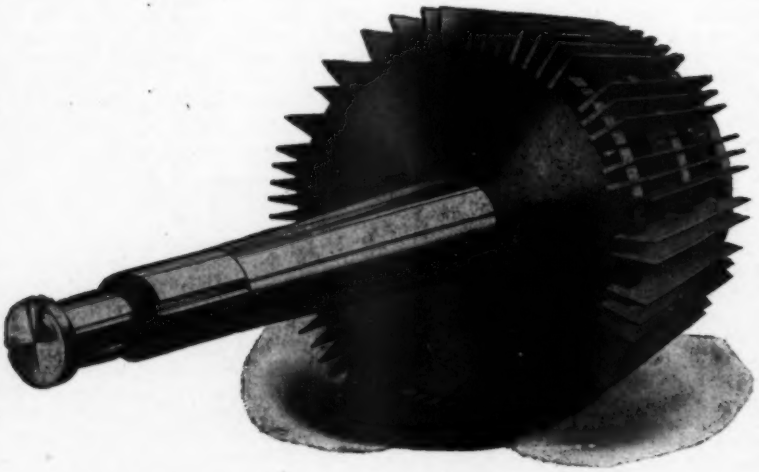
After sixteen years' strenuous work in engineering supervision and power plant construction, Mr. Reynolds was forced to retire for a few years. He has been in charge of the Elliott-Fisher Co., of Harrisburg, Pa., for the past two years as works manager. Rehabilitation of the A. W. P. Co. plants under the program as laid out by the reorganization committee will need just such a man as Mr. Reynolds to guide it. Mr. Reynolds intends to bring his family to Holyoke shortly.

The Hollingsworth & Whitney Co. announce that their pulp mills at Winslow, Me., which have been on a five-day week schedule for some time, will shortly return to a six-day schedule. There are 1,400 employees involved.

Holyoke paper men have been honored by election to various offices of late. Seth L. Bush, manager of research for the Crocker-McElwain Co., has been elected first vice-president of the Holyoke Chamber of Commerce; Phillip M. Judd, of the Judd Paper Co., was elected second vice-president of

Send Us Your Old Beater Rolls

Mills frequently send us their old rolls of the banded or bandless type, made by other manufacturers, to be rebuilt into our type of Bandless Beater Roll. They would not do this, unless they had some mighty good reasons.



Downingtown Bandless Beater Rolls have crucible steel heads and milled dovetail slots to hold the flybars,—the flybars having dovetail lugs to fill the slots, milled to a perfect fit. Compare this with keys, wedges, bolts and nuts, bands, fusible metals, etc., used to secure flybars in other rolls and you will learn why many concerns are sending us their old rolls.

Why not change your old-fashioned rolls to our Bandless Type and be assured of full wear from flybars? Send us one of your old rolls and note the result.

Catalog on Request

DOWNINGTOWN MANUFACTURING COMPANY
Paper and Pulp Mill Machinery
EAST DOWNINGTOWN, PA., U.S.A.

the same organization; R. F. McElwain, of the Association mills, was elected a member of the Massachusetts Council of the New England Conference, as was Winthrop Murray Crane, of Crane & Co., Dalton. The New England Conference is a combination of industrial and financial interests, who meet periodically to discuss and take action on ways and means of maintaining and increasing New England's industrial and agricultural prosperity.

I. S. Dillingham

I. S. Dillingham, 85 years of age, and for sixty years connected with the paper industry as a procurer of raw materials, chiefly bagging and other jute stock, died early in November at his home in Auburndale, near Boston. Many years ago he was a buyer of jute stock for Hollingsworth & Whitney Co. when that concern were larger users of bagging in making paper. Of late he has dealt extensively in gunny and scrap burlap for tissue and other paper making. He is survived by his widow and three children.

The Federal Reserve Bank of New England, commenting on the paper industry in this section, states that "Mill output usually declines in the late fall, and the reports of the cover, tissue and writing paper manufacturers bear this out, that such a contraction has taken place this fall. The decrease, however, has been very slight and production has been maintained somewhat above 1925. Orders started declining in October but by the first of December had not shrunk as they did a year ago at this time."

Another Holyoke Paper Maker Honored

Election of Clifton A. Crocker, president of Crocker-McElwain Co. and the Chemical Paper Mfg. Co., to the position of vice-president of the Springfield National Bank, Springfield, Mass., is another honor to this outstanding paper maker of New England. Mr. Crocker is vice-president of the National Equipment Co., is connected with other corporations and is a trustee of Springfield College. During the war he was a member of the National War Labor Board.

Mr. Crocker was born of a paper making family but started in to learn the business at the bottom of the ladder. He began as an office boy; worked through every department of the mills, and became treasurer and manager of the Crocker Mfg. Co., of Holyoke, at the age of 28. His company was absorbed by the American Writing Paper Co., of which he was director for some years. The Crocker-McElwain Co. was formed in 1903, and he became president and treasurer, a position he has held since.

Mills in Holyoke making use of the surplus water of the Holyoke Water Power Co. have received notice of an advance in rates from $3 to $4 per mill power a quarter. The rate will result in a cost of about two-thirds of a cent per kw. hour when transformed into hydroelectric power by modern equipment. A discount of 20 per cent will be granted if the user is a customer of the Water Power Co. in respect to electrical current.

Budgeting for Slack Business

The Connecticut Valley Division of the Cost Association met in joint session at Holyoke, Mass., on November 17, with the National Association of Cost Accountants. W. S. Kemp, treasurer of the Holtzer-Cabot Electric Co., Boston, Mass., was a substitute speaker for H. N. Sweet, who was unavoidably absent. Mr. Kemp described the system of budgeting employed by his company. The budget is made up three months ahead, being based on the general tendency of business as well as a survey by salesmen among the trade. If a quiet period is expected or any falling off in trade is looked for, the following steps are taken:

1—Purchases are cut down, thereby reducing inventories.

2—Working days are reduced, and if necessary, direct labor also, by putting the factory employees on short time.

3—Overhead expenses are also curtailed by limiting the amount of clerical help and their indirect labor, and if extremely poor business is encountered, the salary of all officers, from the president down, are reduced. Curtailment is also made in sales expenditures, including advertising.

Mr. and Mrs. J. W. Harris, mill manager of the Oxford Paper Co., and Mr. and Mrs. Frank E. Tufts, treasurer of the Oxford Paper Co., with their daughter will sail on the Belgianland from New York on December 15th for a round-the-world tour.

Through the efforts of the English China Clay Sales Corp., the 25c per ton unloading charge of china clay at the Mystic wharves of the Boston & Maine R. R. will be abolished by January 1. This means about 30c per gross ton in bulk clay. It is also understood that the Boston & Maine will enlarge and improve their facilities for handling clay at Mystic piers in Boston harbor.

Albert Wilson, director of Edwin Butterworth & Co., Ltd., of Boston, sailed on his return to England this month, after a month's visit to the American subsidiary, Edwin Butterworth & Co., Inc., of Boston.

WISCONSIN NEWS

George W. Mead Acquires Control of Consolidated

Among the important occurrences in the Wisconsin paper industry during the past month was the stock transfer by which, it is understood, George W. Mead, president of the Consolidated Water Power and Paper Co., of Wisconsin Rapids, acquired the controlling interest of the corporation. Mr. Mead purchased all of the stock held by Isaac P. Witter, treasurer, who had been connected with the company since its beginning twenty-five years ago and whose father, Jere D. Witter, founded the company.

Poor health was mentioned by Mr. Witter as the reason for his retirement from the company. Because of this situation, he was unwilling to retain the responsibility connected with his position and he therefore thought it best to dispose of his entire holdings. He is planning to spend considerable time in traveling in order to regain his health. The Consolidated company came into being when Mr. Witter's father merged the various water powers on the Wisconsin river. He died the following year and left his entire holdings to the Witter estate, of which I. P. Witter was the principal heir. The organization was carried on by Mr. Witter and Mr. Mead, his brother-in-law. It operates mills at Appleton, Wisconsin Rapids, Biron, Stevens Point, Wis., and Port Arthur, Ontario. Simultaneous with the announcement of the stock transfer, also comes the news that George P. Berkey has resigned as vice-president and general manager. Mr. Berkey formerly was manager of the Interlake Pulp and Paper Company, of Appleton, a subsidiary of the Consolidated. He was with the organization since 1908.

The Rapid Croche dam on the Fox river between Kaukauna and De Pere, which has been in construction for about a year, has been completed. It will furnish power for the city of Kaukauna and a number of paper mills in this vicinity. It was built by the Green Bay and Mississippi Canal Company to replace an old dam. The dam is 587.7 feet long.

The Esco Paper Company, organized in Peshtigo last spring, has been purchased by the Menasha Printing and Carton Company, Menasha, and will be moved to Ashland, where it will be combined with its Ashland paper mill. Several of the Esco company department heads will be retained. The company was organized by Chicago interests six months ago for the manufacture of paper novelties.

Several demonstrations were held in the plant of the De Pere Pulp Company, De Pere, to test out the process of bleaching brown pulp and de-inking old newspapers and magazines perfected by John Neumann, who recently leased this mill for the American Pulp Company, of Chicago. The

Question No. 3

About Sectional Paper Machine Drive

How much power can be saved with Sectional Drive?

Answer:

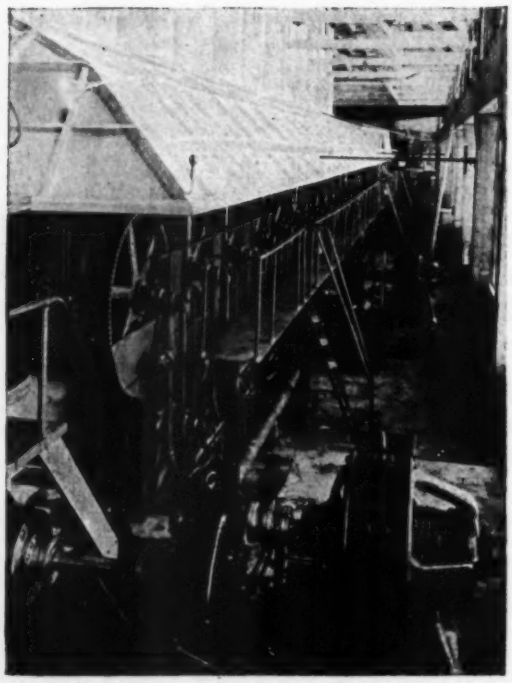
25 to 200 hp.

QUITE a saving. On a percentage basis the power saved with Westinghouse Sectional Drive varies from 15 to 50 per cent of that required for mechanical drive—the exact figure depends upon the size, speed and type of paper machine and upon the condition of the mechanical drive.

Westinghouse Sectional Drive applies power directly. Highly efficient motor gear units replace inefficient belts, cone pulleys, rope drive, line shafts, and a multiplicity of open bevel and spur gears.

Power is a considerable element in the production of paper. A saving in power increases your profits—helps you to meet competition.

Westinghouse engineers can give accurate figures showing the savings that sectional drive would make in your power bill—figures based on the results of previous installations.



Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

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Sectional Paper Machine Drive

experiments have been made by means of a "recovery" machine invented by Mr. Neumann. The demonstrations were made before officers of the company, who, it is announced, declared themselves very much satisfied with the results. This machine, built by an Appleton machine company, bleached three tons of dark pulp into a pure white in less than an hour. The exact time was 53 minutes, it is said. The fiber was declared to be of a much finer and tougher texture after the treatment.

According to a ruling by the Wisconsin Insurance Commissioner, O. H. Johnson, the group insurance plan, used extensively by paper mills of this state, is illegal. He declares it discriminatory on the part of insurance companies to expect individual policyholders to submit to an examination and waive the same thing for those insured on the group plan.

A settlement for $15,000 was made last month between William Moore, plaintiff, an employee of the Marinette and Menominee Paper Co., Marinette, and the Chicago, Milwaukee and St. Paul Railway, defendant, following the institution of proceedings for damages as the result of serious injuries suffered by Moore in a freight car near the plant. While he was unloading pulp at the mill the car received a severe jolt and he was thrown to the floor, suffering a broken neck. He is said to be completely disabled, and must wear a cast to protect his neck against the least jar, which may cause his death at any time. He sued the railroad company for $50,000.

Thirty-Eight Years Without an Accident

To be in the employ of one concern for thirty-eight years without sustaining one lost time accident, is the rather remarkable record of August Lang, who on Tuesday, November 30, punched the time clock at the Marinette & Menominee Paper Company for the last time, to retire from this work-a-day world.

Mr. Lang came to this country in 1882 from Lang County, near Berlin, Germany. After spending about six years at various jobs, he entered the employ of the Marinette & Menominee Paper Co. as a mill hand, where he has been ever since. He is still hale and hearty and from all appearances has many years yet ahead of him. As a token of esteem, the company presented him with a gold watch.

The new warehouse for the Bergstrom Paper Company, of Neenah, was completed last week by Flour Brothers, contractors, and the elevators and other machinery, which constitute a part of the equipment, will be installed presently. The new building is 160 by 80 feet and has six stories.

Several thousand tons of straw has been purchased by the newly organized Menasha Paper Mills Company, Menasha, which recently purchased the plant of the defunct Island Paper Company, of that city. The material will be used in the manufacture of strawboard. Operations are expected to begin this month. The straw has been purchased in nearby counties and from Minnesota, North Dakota and South Dakota.

A series of lectures on pulp and paper making, illustrated with films to be furnished by the Forest Products Laboratory, of Madison, Wis., will be given to employees of the Fox River Valley paper mills this winter under the auspices of the Appleton Vocational School. A lecture will be given each month, with experts in various branches of the paper industry as the speakers.

The new office building of the Neenah Paper Company, of Neenah, has been completed, as far as the exterior work is concerned, and work is now being done on the interior. The building is of Stevens Point stone and Colonial in design. The landscape work will be done in the spring. The first floor will be used for main offices and the second floor for additional offices and mill laboratory.

A paper mill library has been established by the Appleton Vocational School to provide reference help to the employees of paper mills in the Fox River Valley. H. G. Noyes, who has been engaged as instructor in paper and pulp mill courses, will be in charge of the work, and he will have the co-operation of Arthur McArthur, director of education at the Kimberly-Clark Company, Neenah. The latter has himself built up a big paper mill library for his concern during the last three years.

The winning of THE PAPER INDUSTRY safety cup by the Neenah mill of the Kimberly-Clark Company, Neenah, was celebrated in jubilant style. A band and a large crowd of people gathered at the station to meet Edward Goodman, who was sent to the National Safety Congress in Detroit to bring home the trophy. A parade was then held, a feature of which was a beautiful float bearing the trophy. A dinner was served for the employees at the Equitable Fraternal Union hall, and this was followed by dancing.

The season's second cargo of China clay transported direct from England via the Great Lakes was received at the Milwaukee port last month. The clay was destined for paper coating in Fox river valley mills. A similar shipment was received earlier in the year.

The Fox River Paper Co., of Appleton, is installing a small water wheel which will be used to furnish lighting and elevator power. This necessitated the removal of one flume in order to make room for the wheel.

The Wisconsin Manufacturers' Association has issued a bulletin to the various state publications to show how great a part paper manufacture plays in the state industries. The daily production for Wisconsin is given as 2,200 tons, which is carried on in sixty paper and pulp mills in thirty-two Wisconsin cities. The mills employ a total of 17,000 hands, are capitalized at $118,000,000, and pay in wages $21,000,000 a year. Newsprint is still first in quantity of production, with wrapping paper second and wallboard third.

The Moloch Foundry and Machine Co., of Kaukauna, makers of paper mill machinery, last week held open house for its stockholders and friends. The company has been recently reorganized, and a number of new improvements have been made in the plant.

Frank Wilson, for many years superintendent of the Atlas Mill of the Kimberly-Clark Company, Appleton, died last week in Perry, Mont., according to word received by friends in the former city.

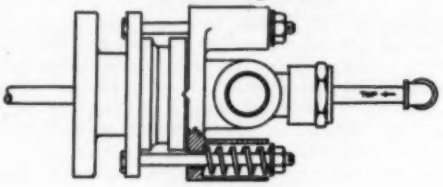
Seventy-five thousand pounds of special paper for use in printing liquor selling permits were turned out last month in a Stevens Point paper mill for the United States government. Four agents of the prohibition enforcement forces were on guard during the manufacture of the paper to see that all of it reached the United States Bureau of Engraving.

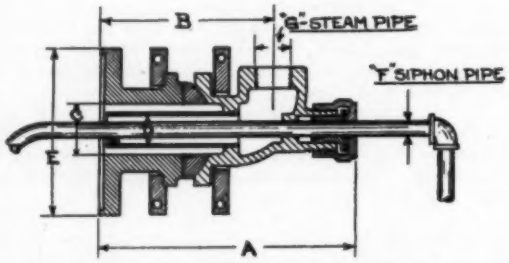
A golden opportunity that would have meant millions for him was passed up by August Gustin, superintendent of an Oconto Falls, Wis., paper mill, it is related in a lengthy article that appeared recently in The Milwaukee Journal. Gustin is credited with the invention of the process for making hemlock suitable for pulp manufacture. He received his early training in laboratories in Austria and at one time was head of a pulp mill at Port Huron, Mich. He also discovered a kraft paper manufacturing process which he relinquished to Wisconsin mills without patenting it, the article states.

The Wickes Boiler Co., Saginaw, Mich., announces that Mr. Henry E. Aldrich has been appointed general manager with headquarters at Saginaw. Mr. J. Robert Fortune has been appointed general sales manager of the company with headquarters at General Motors Bldg., Detroit. It is also announced that the Detroit district sales office will move to the General Motors Bldg., January 1, 1927.

The Solvay Process Co., announce that, effective January 1, 1927, a new company known as Solvay Sales Corp., will become the exclusive distributor of the products of the Solvay Process Co.

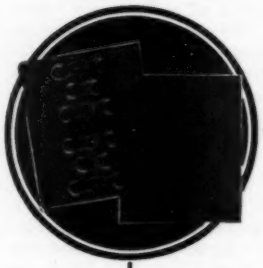
Farnham Steam Joints for Dryers





Equalized Spring Release—Accurately Ground Joint — Steam and Siphon Pipes Adjustable to Any Position—Siphon Pipe Position Indicated Outside of Joint.

FARNHAM MFG. CO., Buffalo, N. Y.



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8" Horizontally Split Casing Single Suction Belted Pump for Handling Heavy Stock

Built in sizes ranging from 2" to 18". 42 years designing and building centrifugal pumps for all conditions and service. Our engineering staff is ever at your service.
Please submit your specifications.

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THE Tide Water Engineering Bureau is at your service in solving all lubrication problems. This expert service is entirely *without cost or obligation.* Send a card today and one of our Staff Engineers will be glad to call at your mill to make a lubrication survey under your direction.

The Tide Water Power Group *—for paper mill lubrication*

TYCOL GEAR COMPOUND
A soft, semi-fibrous grease for enclosed gears under heavy pressure.

TYCOL MEDIUM YARN GREASE
For beater bearings where high temperatures, heavy pressures and water are present.

TYCOL YARN GREASE
For dryer and other bearings operating at high temperatures.

TYCOL LUBRICANT NO. 1
A medium hard grease for Jordans, grease lubricated calender rolls, and for general use.

TYCOL GREASE
A hard grease for replenishing Tycol Yarn Grease.

TYCOL GEAR COATING SOFT
A viscous lubricant especially recommended for use on slow-moving open gears.

TIDE WATER OIL SALES CORPORATION
11 BROADWAY NEW YORK

News Briefs from Washington

Consular Reports

French Pulp Mill Expands.—A report from Consul Gaston Smith at Calais, France, states that the pulp mill of the Societe Calaisienne des Pates a Papier S. A. is enlarging its plant so that by the middle of 1927 its capacity will be doubled. The present capacity of the mill is 12,000 metric tons annually of mitscherlich pulp, the yearly spruce requirement for this output being 32,500 tons, most of which is imported from Finland and the other Baltic States. Present equipment is of German make, but the machinery for the new section of the mill has been made entirely in France. The plant at present employs 250 laborers. The product is at present marketed entirely in France, and it is anticipated that the additional 13,000 tons will be absorbed within the country also. All sales and contracts are being made on the basis of the pound sterling.

Caroa Fiber Paper Samples Available.—Samples of writing and wrapping papers made from caroa fiber at the experimental mill at the Bureau of Standards can be obtained for examination from the Paper Division of the Bureau of Foreign and Domestic Commerce upon application. Caroa is a fibrous grass native to Brazil and has long been looked upon as a promising paper stock from a technological point of view. This is the first time a sufficient quantity has been available to make a semi-commercial trial run of it.

Sweden Dubious About Japanese Market.—Consul C. I. Dawson at Stockholm, Sweden, reports that the Swedish paper manufacturers, who provide 30 per cent of Japan's imports of paper, are regarding the Japanese market with considerable anxiety following a season which has been abnormal in many respects. Usually the summer months are dull, the market picking up noticeably at the beginning of the fall season. This year has proved an exception. During the first half of 1926 imports of foreign paper increased considerably and coincidentally domestic production gained tremendously. Stocks are now said to be 14 per cent above normal and it is believed that this surplus can not be absorbed until next year. Swedish exporters of kraft and sulphite wrappings look with considerable misgivings upon what promises to be a period of stagnation.

American Paper in Chile.—Vice Consul J. L. Steward at Concepcion, Chile, states that "American blotting and toilet papers predominate the market in these two branches of the paper trade. It appears that American manufacturers are excluded from competition in printing paper by reason of both price and form of preparation for exporting to this market.

"It is estimated that approximately 5,000 tons of printing paper are imported into this district each year. It must be shipped in bales containing ten reams, with sheets of the dimensions 77 by 110 centimeters, each ream to weigh 19 kilograms and it must contain only mechanical wood pulp, and with a white or light cream color. The paper must not be limed, but may be satined. This paper is used by the small newspapers and printing establishments, but its greatest employment is for wrapping purposes. The present price is $92.34 U. S. currency per ton c.i.f. Talcahuano, Chile, this price having dropped from the January level of $104.60 per ton."

Domestic Sales Cartel in Czechoslovakia.—Negotiations looking to the formation of a domestic sales cartel in the Czechoslovak pulp and paper industry are now so nearly concluded that it may be effective by January 1, 1927, or at latest February 1. This cartel will include all paper mills in the country, with the exception of those making cigarette paper. Members will be committed to sales and market agreements over a period of years, but applicable to domestic sales only, exports not to be included. It is expected that production will be concentrated and some mills closed and their affairs liquidated. Similar negotiations are reaching a conclusion among the cellulose mills and it is expected that a syndicate among this branch of the industry will also become effective about January 1. The extension of the latter syndicate to include cellulose mills in Austria and Germany is under consideration.

Recent Tests on Glue in Coated Papers

The Bureau of Standards, in co-operation with the National Association of Glue Manufacturers, has just completed an investigation of alternative adhesives used in the manufacture of coated paper. The chief reasons advanced for not using glue have been price considerations, lack of waterproof qualities, and reputed variations in quality. There has also been some question as to the printing qualities of glue-bound coated paper.

These factors have been extensively studied in laboratory tests and in semi-commercial runs in the experimental paper mill, and commercial scale runs were made at a paper-coating plant. Printing tests of the papers coated were made frequently and a demonstration of the results was given to representatives of the glue and coated paper industries. The results indicate that the proportion of glue required in coating mixtures varies with the grade of glue used. When the better grades are used the proportion needed may be less than that of casein, the material now in general use.

Little change in present coating equipment and operating technique is required by the use of glue, since the various grades available offer a choice within which local conditions may be met. Uniformity in glue for coating purposes may be attained by drawing specifications to meet local and product requirements. Ordinary glue-bound coated paper offers no new difficulties in printing except in those printing and lithographic and possibly off-set processes where a high degree of water resistance is required.

Ichu Grass as Pulp Material

Stipa ichu, commonly called "ichu grass," is indigenous to the regions of South America southward through the Andes to Argentina. In many parts of the Andes it is a dominant grass above the timber line. Tests on this grass, a quantity of which was received from the Ecuadorean Legation, were recently made at the Bureau of Standards to determine the value of the material as a potential source of pulp for paper making. The tests were limited to laboratory scale production and consisted of the usual paper-making processes of cooking and beating the material and converting the resultant pulp into sheets of finished paper. The sheets made were submitted to various physical tests which are applied in evaluation of paper. Two cooking processes were included, one employing 25 per cent of caustic soda as the digesting agent, the other 25 per cent of lime. The yield of pulp obtained was 25.5 per cent and 56.6 per cent, respectively.

The yield from the lime cook compares favorably with that of commonly used paper making materials, but the strength of the paper made from the pulp was insufficient to meet the usual requirements. The yield from the caustic soda process is not satisfactory from an economic point of view, and to have bleached the resultant pulp would have required a relatively large amount of bleaching powder, the use of which would have further reduced the amount of pulp available for conversion into paper.

On account of low yield, high chemical consumption, and lack of strength, ichu grass is not considered a promising material for the manufacture of paper in general. As this grass gives a soft and bulky sheet it might be used as a filler with the strong fibered pulps and would doubtless be a suitable material for the production of papers in which those particular qualities are desired.

Builders of High Class

Paper Making Machinery

I. P. Morris and Pelton
Hydraulic Turbines and Accessories

4-270" High Speed News Machines are now under construction for a new Canadian Mill, and embody the following special features:—

Van de Carr Slices.

Oscillating Suction Boxes.

Suction Couch Rolls.

Suction Press Rolls.

Canadian Granite Top Press Rolls.

Antifriction Bearings on Breast, Table, Wire, Wet Felt and Dryer Canvas Rolls.

Worm and worm wheel driving mechanism for dryers, to ensure safe running at high speed.

Provision has also been made for mechanical handling of the heavy rolls when changing wires and felts.

P17

DOMINION ENGINEERING WORKS
LIMITED
MONTREAL CANADA

See page 336 in the 1926 Paper and Pulp Mill Catalogue

Canadian Section

Production Record Established at Corner Brook

The Newfoundland Power and Paper Company's mill at Corner Brook, Nfd., established what is claimed to be a record for a 24-hours' production of newsprint in a four-machine mill when it turned out 408 tons a month ago. The day after this record was made the mill produced 406 tons, as if to prove that the new record would soon be broken.

The plant of Newfoundland Power and Paper Co. contains four 234-inch machines devoted exclusively to the manufacture of standard newsprint. The first of these machines came into operation a little over a year ago, and the last one was started up in July of this year.

Both this company and the Anglo-Newfoundland Development Co.'s mill are operating at full capacity and the report is current that operations may soon be started on the erection of another plant on the Gander River.

Record-Breaking Newsprint Production

The report of the News Print Service Bureau, covering production of newsprint in Canada and the United States for October and the ten months to date, continues the steady climb to new and unexpected records, not only in production, but also in consumption. During the month of October, Canadian mills produced 168,860 tons, the highest in their history and over 25,000 tons more than the United States mills, and shipped practically the same quantity. Their production for October ran 31,354 tons ahead of October of last year.

For the first ten months to the end of October, production in Canada has actually been higher than during the entire twelve months of 1925, which themselves ran far ahead of any other year.

Numerous Wood Stave Pipe Installations

In April of this year, the Pacific Coast Co. completed for the Riordon Corporation a British Columbia fir, pressure-creosoted wood stave pipe, one mile long, 13 feet in diameter, which operates under a maximum head of 92 feet. It is for power development for the mill at Temiskaming and was completed in record time.

The company recently finished for the Manitoba Paper Co., at the Pine Falls mill, a 48-inch pressure-creosoted wood stave sewer; and for the Spruce Falls Co.'s new plant at Kapuskasing, Ont., they have furnished, through Morrow and Beatty, 69-inch and 48-inch pressure-creosoted wood stave sewer pipes. A contract has just been made with the Ste. Anne Paper Co., of Ste. Anne de Beaupré, Que., for one and a half miles of 36-inch pressure-creosoted wood stave pipe for mill water supply for the new mill.

According to a report of the forestry sub-committee of the recent Imperial Conference in London, England, "A review of the forestry situation throughout the world leads to the conclusion that available supplies of the principal timbers of commerce are daily approaching exhaustion, and there is every likelihood that in less than thirty years the shortage of soft woods will be severely felt." The United States, it is stated, has only twenty-five years' supply of timber left, apart from the produce of second growth areas. It is understood that these resources will soon be limited to a few western states. Canada has only twenty-seven per cent of her original forest left, and her virgin soft wood resources will last only another quarter century.

By a ruling of the Customs Department of Ottawa, four-drinier wires imported into Canada now come in under a 30 per cent duty, instead of 25 per cent as formerly, the action having been taken in consequence of representations made by the Canadian wire manufacturers.

The Canadian Pulp and Paper Association has been invited to make an appearance before the Canadian Railway Commission hearings on general revision of freight rates, which opened in Ottawa on November 30th, for the purpose of presenting the paper industry's view on the subject.

Arrangements have been made for the annual meeting of the Canadian Pulpwood Association, to be held in Montreal during the first week in February.

QUEBEC

W. I. Bishop Co. Awarded Anglo-Canadian Contract

The contract for the construction of the new pulp and paper mill of the Anglo-Canadian Pulp and Paper Co., at Limoilou, a suburb of Quebec, has been awarded to the firm of W. I. Bishop & Co., of Montreal. Major M. J. McKewen, construction engineer in charge of the work, and his staff of engineers, are already on the ground, several hundred men are at work, and it is expected that some 950 men will be employed throughout the winter, the intention being to push the construction as much as possible with a view to having the mill in operation by November, 1927.

Preparatory to the building of the mill a most interesting piece of work had to be undertaken. The company secured about 96 acres at the junction of the St. Charles and St. Lawrence rivers, the bulk of the property being under water at high tide. A dam was built around the property and the Dredging Co., Ltd., have been pouring sand, taken from the river bed, at the rate of about 12,000 cubic yards a day. Eventually this area will be built up level with the land above high water mark, and the mills will be erected thereon.

The new mill will require about 2,000 tons of structural steel which will be supplied by the Dominion Bridge Co. There will eventually be eight paper machines, though only four will be installed at first. Approximately one thousand men will be employed in the mill, this gradually being increased to two thousand as the new machines are installed.

The direction of the design and engineering of this huge project, which will run between $12,000,000 and $15,000,000, is in the hands of George F. Hardy, of New York, and his Canadian collaborators, Trotter & Cate, of Montreal.

Almost coincidental with the awarding of the contract for the construction of its mills, Anglo-Canadian Pulp and Paper has made a deal with the Oxford Paper Co., whereby they will take over the timber lease of the latter along the upper banks of the Montmorency river, which is held in freehold by the Quebec Seminary. The lease held by the Oxford Co. has still eight years to run, so that for the next eight years at least Anglo-Canadian will have a supply of pulpwood on hand almost at the door of their new mill.

Though the details of the transaction have not been made public, it is understood that there are something like two million cords of pulpwood available on the limits, and as the transaction covers freehold property the price is said to range between $1 and $1.50 per cord, which would bring the estimated price somewhere between two and three million dollars.

Work on the building of the new mill of Mistassini Pulp and Paper Co., at Mistassini, which has been under way since last August, is making good progress, and it is considered likely that the building of twenty miles of railroad from the present end of steel to Mistassini, will commence in the near future. At present mill requirements are taken up the Mistassini river by scow to the mill site, which will no longer be necessary when the road will have been built. It is hoped that

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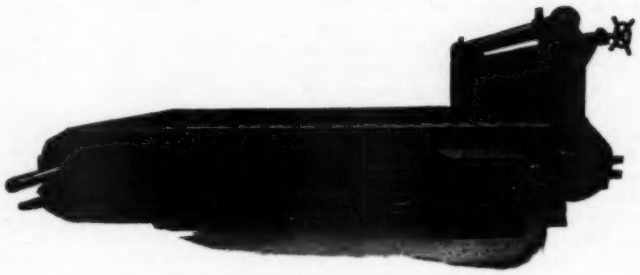

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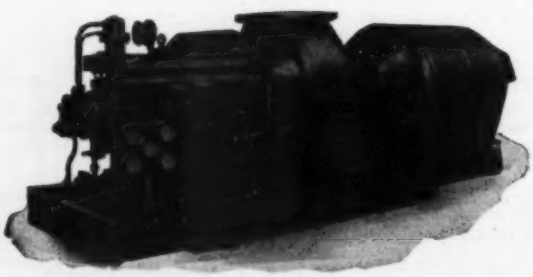

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paper shipments will be started next August, nearly six months ahead of the time-limit set by the Government.

Another News Mill Projected Near Ottawa

Negotiations have been entered into between the township council of South Hull and representatives of a company for the erection of a 200-ton newsprint mill on the Fraser property between Deschenes and Aylmer. The mill will cost between $3,000,000 and $4,000,000, will give permanent employment to more than 200 men and will have a daily capacity of about 200 tons. It is said that Nesbitt Thompson & Co. are back of the project, and that the board of directors will consist of former members of the Edwards, Gillies, Fraser and Bronson companies.

The question of assessment is said to have been settled, and erection of the mill will get under way probably next spring.

Prominent Paper Maker Passes On

F. N. McCrea, president of Brompton Pulp & Paper Co., Liberal member for Sherbrooke in the House of Commons from 1911 to 1925, and long prominent in the business life of Sherbrooke and the Eastern Townships, has passed on to his reward. Mr. McCrea had suffered for several years from heart trouble, a previous illness having been almost fatal.

He was, in the truest sense, a self-made man, having started his lumber career when only twenty-one, by engaging in the bark and lumber business in South Durham. In 1902 Mr. McCrea became president of the Lotbinière and Megantic Railway Co. and vice-president of the Lotbinière Lumber Co. Later, with associates, he purchased 500 miles of Government timber limits and organized the Sherbrooke Lumber Co., of which he was appointed president in 1904. Later he took part in the reorganization of the Brompton Pulp and Paper Co., which took over the Royal Paper Mills Co.'s plant at East Angus and their large timber limits on the St. Francis River in 1907.

In business life, the late Mr. McCrea was known chiefly as president of the Brompton Pulp & Paper Co. He was also head of the Stanstead and Sherbrooke Mutual Life Insurance Co., the Federal Asbestos Co., and was president or director of several other Eastern Township concerns, most of them connected with the lumber industry. E. W. Tobin, M. P., who with Mr. McCrea was one of the heaviest holders of Brompton securities at the time of reorganization, has been elected president.

C. W. Walker Promoted to Three Rivers

Charles W. Walker, general superintendent of the Hudson River mill of International Paper, has been transferred from Corinth, N. Y., to the big plant at Three Rivers, which is the largest paper mill in the world. Mr. Walker has been superintendent at Corinth for the past twelve years, and since his first connection with the mill has been exceedingly popular with the thousand or more employees under him. The transfer is in the nature of an advancement and is in recognition of his valuable services in directing production at Corinth since 1914.

In going to Three Rivers, Mr. Walker succeeds Mr. Murray, formerly of Fort Edward, who had been in charge of the Three Rivers mill since its establishment, and who has recently been transferred to the new Gatineau mill. The latter is expected to start up early in the new year.

Alfred Blanchette, 28 years, met death ten minutes after he had started to work at the International Paper Co.'s mill, Three Rivers, on the morning of November 5th. He was carried away by a rolling chain and cut in two at a small tunnel used to let the wood come into the mill. Blanchette was the father of two children.

Activities at Anticosti Island

Official notice has been given by the Anticosti Corporation that it intends to build wharves at Anticosti Island, which it recently took over from Senator Menier, of France. These wharves will be built at a point known as Ellis Bay. The activities of the Anticosti Corporation this winter will be confined to the cutting of timber, which will be shipped early next spring to the mills of companies interested in the corporation. Nearly two thousand men will be engaged in cutting operations this winter.

In answer to a report published to the effect that the Corporation intended building a pulp mill on the Island of Anticosti during the present winter, J. A. Renaud, manager of the Quebec office, stated that they had not the least intention to build pulp mills on the Island for the next ten years at least.

St. Lawrence Paper Mills, Ltd., of Montreal, has leased office space in the building located at 342 Madison Avenue, New York City.

A new local union of the International Brotherhood of Papermakers has been organized at Port Alfred through the activities of Arthur Huggins, who has been in charge of the Brotherhood's office at Three Rivers, and this union has already been granted its charter. Other locals in the vicinity of Three Rivers are in progress of formation.

Hubert Biermans, late of the Belgo-Canadian Pulp & Paper Co., which he founded (now incorporated in the St. Maurice Valley Corporation), sailed from New York for France last month, intending to make his future home in that country. Previous to his departure, his friends in the paper industry entertained him at a farewell dinner at the Ritz-Carlton Hotel, Montreal, on Wednesday evening, November 3rd, which brought together a number of representative leaders from different parts of the country.

During the last few months the Johnson Wire Works, Montreal, have been erecting an additional building which is to be used for the weaving of very wide wires. They have orders on the books at the present time for fourdrinier wires 270 inches wide, and they have the necessary machinery installed and operating on this width. The new looms are equipped to weave up to 310 inches wide so that wires of a much greater width could be woven, sufficient for a four-roll machine.

New Mill Reported for Price Brothers

According to information from Chicoutimi, it is the intention of Price Brothers & Co. to erect large mills at Grande Baie. In fact, the company is understood to have purchased a large area of land belonging to Herménégilde Simard for $80,000, as well as a number of other properties. The land purchased from Simard has an area of some seventy acres, and the other properties taken over according to the same report have an area of 25,000 square feet.

From the same source it is also learned that construction work on the new mill will start early in the spring of 1927. Ample railway facilities will be available as only a few miles of construction will unite Port Alfred with St. Alexis.

Not less than $110,000 has been paid out in compensation during this year by the Duke-Price Co. to farmers in the Lake St. John district for damages caused by the flooding of the land. The farmers in the district claimed this amount for damages to their crops due to the inundation of the land as a result of the damming of outlet of the lake at Ile Maligne by the Duke-Price Co. This compensation is for damage caused this season. Steps are being taken to compensate the farmers permanently.

Port Alfred Pulp & Paper Corporation have given notice to the Department of Lands and Forests of the Province that they intend to construct and maintain two reservoir dams, one at the outlet of Lake Ha-Ha of the Ha-Ha River, and the other at the outlet of Lac des Cèdres. This will result in a regular flow of the Ha-Ha River and ensure uniformity of supply to aqueducts and workshops and continuity of water power. An order-in-council authorizing the work has been passed.

A new merger in connection with the pulp and paper industry of Canada is under way: St. Maurice Valley Corpora-

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Your problem might best be solved by either the "CASE" dryer or the open dryer, or open racks with final controlled humidity. We design and supply all types and are especially well qualified to make proper recommendations.

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tion is arranging to absorb the Canada Paper Co., which has its head office at Windsor Mills, and manufactures newsprint, wrapping paper, colored papers and has a surplus production of groundwood and sulphate pulp for sale.

The total enrolment in the Institute of Industrial Arts, of Gardenvale, which is conducting a correspondence course in pulp and paper making, had reached 917 at the end of October, and a number of other enrolments were obtained during November. A gratifying aspect of the situation is the number of new students in mills where previous enrolments had taken place, indicating that the Institute is giving satisfactory service and that the value of the work is being recognized by both employees and employers.

Stream Flow Regulated for Power Purposes

At a recent meeting of the Quebec Streams Commission, the final plans regarding the completion of the regulation of the Gatineau River at Lake Baskatong were arranged. It is understood that, when completed, the cost of the enterprise will be $6,000,000 or so. The object of the work is to regulate the flow of the river so that power will be more uniformly distributed throughout the year. When the lake is used as a reservoir, it will have a capacity exceeding 80,000,000,000 cubic feet, and this will mean that the mills and industries depending on the water's flow will be in a position to operate under much better conditions.

Another decision arrived at by the Streams Commission was to start early next spring on the construction of a reservoir at Lake Makinac in the upper St. Maurice. It is expected that the cost of that enterprise will be about $1,500,000.

A group of Canadian financiers, including the Wood Gundy-Port Alfred interests, accompanied by Vice-president W. D. Robb, of the Canadian National Railways, recently visited the Lake St. John district and proceeded to Peribonka where the Port Alfred Pulp & Paper Corporation possesses rights on an area of 1,500 square miles of timber limits. The object of the trip is to decide on the advisability of erecting a pulp and paper mill by the Peribonka. The plans, it is understood, provide for the harnessing of a series of waterfalls, which will allow the operation of the mills to be carried out economically, apart from the supply of power available near the Chute à Caron and Grande Décharge power reserves.

It is reported that the contract for the preliminary work in connection with the construction of the new pulp and paper mill of the St. Regis Paper Co., at Cap Rouge, about six miles above Quebec on the St. Lawrence River, has been awarded, and that work will start on the site of the mill in the near future. The name of the contracting firm has not been made public.

The expansion program of the St. Maurice Valley Corporation will be completed by the end of the year. At the Belgo Division, the first of the two new 234-inch Walmsley newsprint machines was scheduled to begin operating on October 15, and on that day it started up. The second machine is due to start on December 15 and will bring the rated capacity of the mill up to 620 tons of news a day. The company has also completed the installation of another sulphite digester at its St. Maurice Division, at Cap de la Madeleine.

ONTARIO

Lumbermen's Strike Over

After lasting six weeks, the strike of bushworkers in the Thunder Bay and adjoining districts was partially ended recently following a meeting of the joint committee of the Industrial Workers of the World and the Industrial Lumber Workers' Union of Canada, which released some four to five hundred workers to contractors who agreed to pay the scale of wages demanded by the strikers.

Officials of the strike committee announced that an agreement had been entered into by the contractors and the committee relative to wages, the contractors agreeing to the price asked by the men and the committee has compromised by withdrawing the eight-hour-day demand. The agreement is verbal and under it the contractors are not forced to recognize the union.

Considerable Work Being Done at Fort Frances

The Fort Frances Pulp & Paper Co. is installing at its Fort Frances mill a new 224-inch Beloit Iron Works fourdrinier machine, with Harland Interlock sectional electric drive, designed to operate at speeds of up to 1,500 feet per minute. Included in the paper mill extension are requisite facilities for finishing, and a new train shed.

The extension to the grinding mill includes the addition of sixteen four-pocket grinders with a capacity of 160 tons a day, the grinders to be mounted four stones on a line and each line driven by one 2,800-h.-p. synchronous motor. To supply the power for these units, the company has under construction three hydro-electric developments on the Seine River, which is tributary to Rainy Lake, which hydro-electric developments will be connected with the mill at Fort Frances by a high-tension transmission line about 100 miles long. The hydro-electric plant will have an installed capacity of 26,000 kilowatt.

In addition to this, there will be the requisite additions and alterations to the wood room, screen room, etc. With the completion of this extension the capacity of the mill will be 300 tons of newsprint per 24 hours.

The company will also build a railway from Kenora, where they have another newsprint mill, to the English River. The line will be 56 miles long, and it is reported that it may be extended to the Red Lake mining field if development work justifies the cost of construction. The railway will traverse the timber concessions which the company holds and from which will be obtained the pulpwood required for the Kenora mill.

Good Progress at Kapuskasing

The Spruce Falls Power & Paper Co. has completed the erection of a large three-story, concrete storage warehouse at Kapuskasing, and also the extension to the digester building where two additional digesters are being installed, which will increase the output from 110 to 165 tons of sulphite daily. Fifty-five dwellings are now under construction for the mill employees and the new railway from Kapuskasing to Smoky Falls, a distance of about 50 miles, has been completed with the exception of the ballasting, which is now nearing completion.

Next year the erection of the big news mill and the hydro-electric power house at Smoky Falls will be proceeded with, and it is expected that the new divisions will start operating early in 1928.

The Kenora Pulp & Paper Mills, of Kenora, have installed a modern first aid station in a part of the spacious chemical laboratory where in future all accidents will immediately be rushed and first aid administered. Stretchers have been placed at strategic points in the mill and when an accident occurs the injured man is taken to the first aid post where a day and night service is maintained by a staff of registered first aid men under the supervision of N. S. Grant, the chemical engineer.

The contract has recently been let for the steel and concrete work of the new plant of the International Fibreboard Co., Midland, which is being erected to replace the one recently destroyed by fire; and it is hoped that the company will be able to resume operations early in January. The building is being enlarged so that the mill will be able to handle at least 25 per cent more business. The company report that they have enough orders on hand to keep them busy for several months.

The Provincial Paper Mills are installing a second machine at their Port Arthur Division. The machine has been deliv-

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—when he operates a CAMACHINE. And why shouldn't it? CAMACHINES do away with the fussing and tinkering your winderman found was necessary on his old machine to get any sort of satisfactory results.

Let him run a CAMACHINE and we are sure that he will give you more reasons why it is a good roll winder then we would be able to think of ourselves.

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Why not give us the chance to change that frown to a smile?

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ered and is being set up. It is expected that it will be running early in the new year.

The contract has been awarded for a new factory to be erected at London for the Hygrade Corrugated Products Limited, of which C. Munce is manager. The building will be one story, 210 feet by 135 feet, and will cost in the neighborhood of $85,000.

The Hon. William Finlayson, of Midland, has been appointed Minister of Lands and Forests for the province, and has entered upon his new duties. He succeeds the Hon. James Lyons, of Sault Ste. Marie, who resigned some months ago.

The capital stock of the Thunder Bay Co., Ltd., Port Arthur, has been increased from the sum of $100,000 to the sum of $2,000,000 by the creation of 19,000 shares of $100 par value.

At Iroquois Falls

The mill, which has a rated capacity of 500 tons a day, has been operating so efficiently that it is turning out from 530 to 550 tons, which is an accomplishment of which the staff is justly proud. Still further increases in output are being planned, without installation of additional machines, through gearing up existing machines. This work has already been started, and it is believed possible to increase production to from 600 to 650 tons per day. The advantages which would be derived from such a radical speeding up, without appreciable capital outlay, are obvious, and, if generally followed, would make a very great difference in the newsprint industry.

The work of the woods department for last season is practically completed and arrangements for the winter cut of 210,000 cords have been made.

One of the most tragic happenings of recent years in Iroquois Falls occurred a month ago when Arthur Ouellette, lineman for Ansonville, and Thomas F. Flowers, foreman lineman with the Abitibi Company, lost their lives. The accident was caused by something burning out in an oil switch and making the whole switch alive. At several hours' interval the two men climbed the pole on which was the switch to investigate the cause of the trouble and received the full force of the 2,200-volt current.

While P. M. Cannon and Leo Manion were working in No. 1 sulphite tower last month the seal on No. 2 tower broke and the fumes which were raised by the fan settled down into No. 1. The man at the top of the tower called to the men to warn them, but they did not immediately understand. The two men climbed up the ladder only to find themselves in dense gas all the way to the top of the tower. They were long enough in the gas to get a heavy dose of it; but for several days it seemed as if neither of them had taken any great harm. Manion, however, took a turn for the worse, and in spite of the use of oxygen his life could not be saved.

The pipes supplying the compressed air for the hoists handling the paper rolls at the paper machines will each be provided with a small valve; so that if anything happens to the hose connections to the hoist when a roll is raised the air will go out slowly, and the men will have time to get out of the way.

It has been announced by Hon. Charles McCrea, Minister of Mines in Ontario, that the Abitibi Power & Paper Co. will erect a 200-ton news mill at Cochrane, this being part of the company's expansion program. Negotiations for the establishment of this industry have been carried out between Premier Ferguson and Alexander Smith, president of Abitibi, and construction will be begun as soon as plans and details are completed.

Mattagami Pulp Litigation Settled

Mr. Justice Middleton has ratified a settlement of the Mattagami Pulp & Paper Co. case which has been subscribed to by all parties to the dispute. The ratification, made by His Lordship, Mr. Justice Fisher, of the Bankruptcy Court, at the latter's request, brings to an end the lengthy litigation over the affairs of the company.

Under the agreement, unsecured creditors of the company accept from I. W. Killam, president of the Royal Securities

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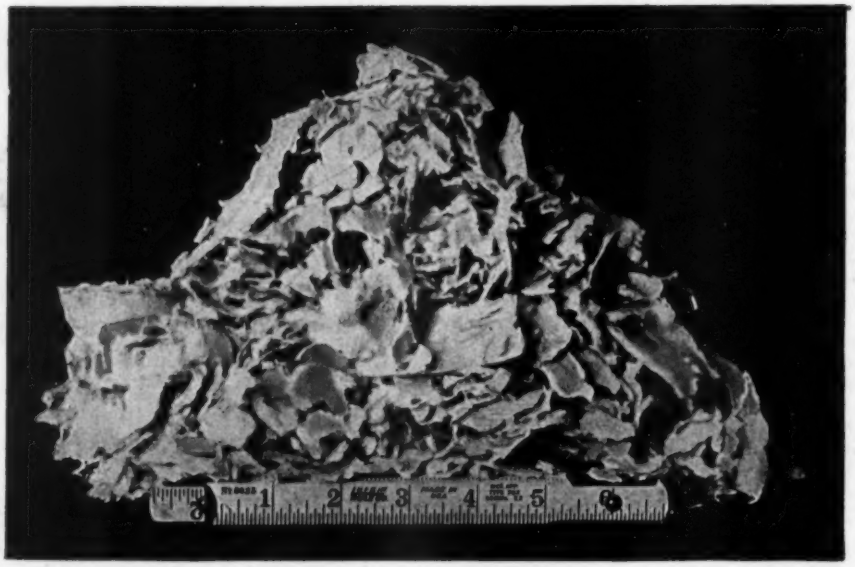

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Corporation, who recently purchased the assets of the company for $7,250,000, a settlement of 25 cents on the dollar. The settlement does away with the necessity of the master in chambers delivering judgment on the validity of the second debenture mortgage bonds issued to par value of $3,935,000. Including interest due, the settlement provides for recognition of these at a value of approximately $115. The first mortgage bonds, amounting to $2,500,000, will be paid in full. Provision is also made for payment of the receivers' and other costs.

The Chicago Tribune and the Ontario Paper Co., of Thorold, have brought a charge of discriminatory and unreasonable rates on shipments of newsprint against the Canadian National Railways before the Interstate Commerce Commission at Washington. Special rates had been granted to other paper mills, the charge says, while several years' efforts failed to get a satisfactory rate for the Tribune and Ontario Paper.

The new pulp mill of the Thunder Bay Pulp & Paper Co., being constructed at Bare Point, near Fort William, is now half finished, and winter will not stop its progress. Dredging is going on for the new dock and the Government is erecting a temporary breakwater.

Walter C. Cain, Deputy Minister of Lands and Forests, recently stated that the air force of the province was maintained not only for the purpose of patroling forest areas to detect and extinguish fires, but also to map, sketch and make a general survey of the wooded resources of the province. This includes making an inventory of the types and quantities of timber in collaboration with ground parties. The air force is also used to transport to outlying districts in an emergency, nurses, doctors, and medical supplies. Mr. Cain added that in Ontario all photographic work of the Department is completed by its own staff and that no flying force in existence in any part of the world, private or otherwise, is maintained at so low cost per flying hour as that of Ontario. Practically all the flying is done by Canadian boys who served in the war.

Strange Accident at Interlake Tissue Mills

In order to repair a beater roll at the plant of the Interlake Tissue Mills, Ltd., Merritton, it was necessary to remove two studs from the end frame of the roll. One of these was so badly corroded that the head had to be sawed off and the stump bored out by means of a portable electric drill. When the drill penetrated the frame a violent explosion took place which completely wrecked the beater, blew out a large steel frame window, did material damage to the buildings and scattered débris to a distance of approximately one hundred feet.

Two men working on the job were so seriously injured that one died in the ambulance and the other died while undergoing an operation in the hospital to relieve concussion of the brain. In addition three other men were injured, one of them quite seriously.

A careful investigation carried out jointly by A. P. Costigane, of the Ontario Pulp and Paper Makers' Safety Association, and President Carruthers and Manager C. Nelson Gain of the Interlake Tissue Mills, showed that the explosion was due to the presence of nitrocellulose inside the roll. The beater had been purchased by the mill from the Imperial Munitions Board and came from a dismantled munitions factory where it had been used for treating nitrocellulose.

Another beater in the line had never been opened up since purchased and, rather than ask an employee of the company to take the risk, Mr. Gain himself bored a hole through one of the wood fillers and flooded the beater with a 10 per cent sodium sulphide solution to decompose any nitrocellulose which might be inside.

MANITOBA

Manitoba Paper Applies for More Limits

The Manitoba Paper Co. has applied to the Minister of the Interior, at Ottawa, for a further area of 1,800 square miles of pulp wood limits in the Province. The new paper mill at

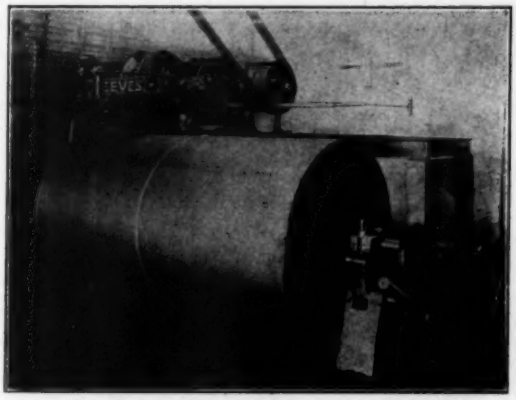


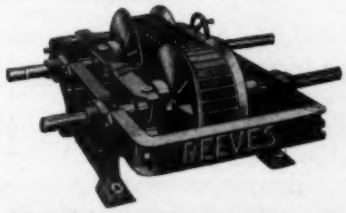
Photo shows a REEVES Transmission operating a Winder at the Cottalap Company, Sommerville, N. J.

Eliminate the Torn Sheets in Winding!

IT'S easy to reduce the waste in torn sheets on your winders when you have the REEVES Variable Speed Transmission. This simple device regulates the speed of the winder and synchronizes it with the speed of the paper machine so that the speed is changed for each difference in the size of the roll. The REEVES is so accurate and so sensitive that torn sheets are reduced to the minimum.

You should have all the facts about the REEVES. Write for catalog A-66 and full information about its application to Cylinder and Fourdrinier Machines, Cutters, Winders, Slitters, Pasting Machines and many others in your plant.

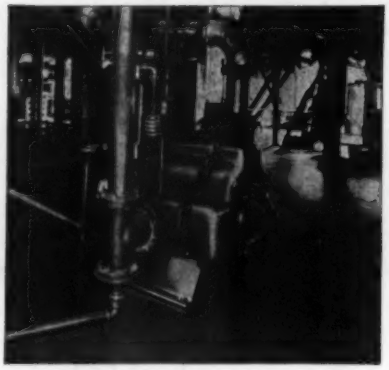
REEVES PULLEY COMPANY
Established 1887
COLUMBUS, INDIANA



THE REEVES Transmission is a simple, compact mechanical device which receives power at a constant speed and delivers it at any speed desired to any machine or group. It will maintain one set speed indefinitely, or may be changed instantly to meet any different operating condition. Accurate and dependable, always.

REEVES
Variable Speed Transmission

Hytor suction free from pulsation



A typical installation of the Nash Hytor Vacuum Pump for use with suction rolls.

Unlike reciprocating equipment, Nash Hytor Vacuum Pumps produce a steady, non-pulsating suction. As a result, wires are free from vibration and last longer. Condensation and air are removed with maximum efficiency and economy.

Nash Hytors, their construction, uses and capacities, are fully described in Nash Bulletins, sent on request.

NASH ENGINEERING COMPANY

So. Norwalk Connecticut

New England Representative
Mr. G. H. Gleason, Nottingham Bldg., Copley Sq., Boston, Mass.

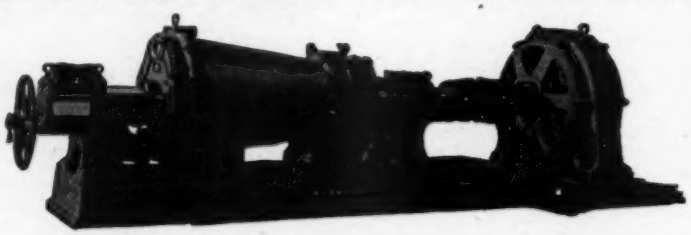
Western Representative
Mr. T. H. Savery, Jr., 600 Railway Exchange Bldg., Chicago, Ill.

Nash Hytor

VACUUM PUMPS AND COMPRESSORS

A JORDAN ENGINE *for* EVERY PURPOSE

Direct Connected Motor Driven Jordans



Six Sizes:—
Baby Jordan
Pony Monarch
Monarch
Mammoth, Jr.
Mammoth
Bull Dog

DURING the past two years, over 80% of our Jordan output has been of the Direct Connected type.

Our Type "D" Jordans are particularly adapted to direct motor drive because of their sturdy construction and the design of our couplings and motor bases permits ample adjustment to insure full wear of Jordan plug and shell knives.

Paper Mill Engineers recognize more fully each day the advantages of Direct Connected units. Greater production and a finer quality of stock can be obtained and, because the speed of a motor is inherently uniform, a maximum quantity of a given grade of stock can be produced. Then, too, through the use of meters, the finishing point of the stock can be accurately indicated and the degree of contact of the Jordan knives can be determined more readily than when the "feel" of the operator alone is relied upon. Because belt pull is eliminated, the undue wear on bearings and eccentric position of the plug, so often found in Belt Driven units, is avoided.

Specifications and Prices Furnished on Request

THE NOBLE & WOOD MACHINE CO. Hoosick Falls, N. Y.

For list of our entire products, see page 387 in the 1925 Paper and Pulp Mill Catalogue

Pine Falls is practically completed and the company has already about 1,800 square miles. It is considered that 1,800 square miles of limits are required to feed a paper mill of one hundred and twenty-five tons daily capacity for a sufficiently long term of years to return to investors their original investment plus profits.

The Manitoba Paper Co., however, has put up a newsprint mill twice as large and therefore requires 3,600 square miles, and would prefer to have it within the boundaries of the territory set aside in the agreement between the Federal Government and the company, in which they are now selecting 1,800 square miles. Under the contract entered into between the company and the Government, the latter is bound to provide sufficient wood for the mill.

Hon. Charles Stewart, Minister of Public Works for Canada, stated recently that British Columbia and Alberta were due for some heavy development in the pulp industry. The Minister added that if experiments now being made in the Pine Falls pulp and paper mill development in Manitoba, which represents an investment of eight millions and covers nearly two thousand square miles of pulpwood limits, prove profitable, the government will make concessions in Alberta and in B. C. to encourage the paper industry. He did not indicate what capital combinations would be involved, but added that a number of big interests with adequate capital are ready to undertake this development further west on a scale equal to that now under way at Pine Falls.

BRITISH COLUMBIA

Roofing Mill to Be Extended

According to manager R. W. Mayhew, the Sidney Roofing & Paper Co., of Victoria, will spend about $100,000 in expanding their plant to meet the requirements of their growing export and local business. New machinery will be installed for making cardboard boxes and new felt-making installations are to be put in in connection with the production of roofing.

At present the plant of the company on the Songhees Industrial Reserve represents a capital investment of $500,000, having been gradually built up since the war from a small beginning. Mr. Mayhew started making rubber roofing in a small plant at Sidney; and when the plant was burned down it was rebuilt on the Government industrial reserve where it has been steadily expanding.

Apart from the roofing products, on which a big export trade has been built up, even across the Pacific, and the cardboard and box lines, the company's plant is now turning out a line of wrapping and other heavy papers.

Westminster Paper Co., of New Westminster, has offered through the Lumbermen's Trust Co., of Portland, Ore., an issue of first (closed) mortgage 6½ per cent serial gold bonds in denominations of $1,000, $500 and $100. The company proposes to use the proceeds of this bond issue to purchase $100,000 first mortgage 6½ per cent gold bonds of its American subsidiary, the Pacific Coast Paper Mills, the latter company to use the funds for the enlarging of the plant at Bellingham, Wash., and complete the installation of necessary new machinery and equipment. The remainder of the proceeds after this improvement has been made at Bellingham will be used for the installation of additional machinery and equipment at the New Westminster mill.

British Columbia Seed for New Zealand

Forming the largest individual shipment of tree seed ever assembled in the British Empire, 3,200 pounds of yellow pine seed was shipped recently from the Dominion Government seed extraction plant at New Westminster to New Zealand. The seed, which was gathered in the district around Kamloops and Lytton will be sown principally on New Zealand waste lands, which the New Zealand director of forestry, Captain MacIntosh, a Canadian, appointed six years ago,

"Eliminate Time Losses and Reduce Belt Trouble"

By using Standard Self Aligning Belt Fasteners Special Rust Proof No. 66 for 6 to 8 ply Transmission or Conveyor Belts any width.

You can't go wrong.

Self Aligning hold the plate firm and square on the belt while rivets are being driven.

It is not necessary to use a rivet holder. Nibs in the rivet hole align the rivet lengthwise of belt, the right way.

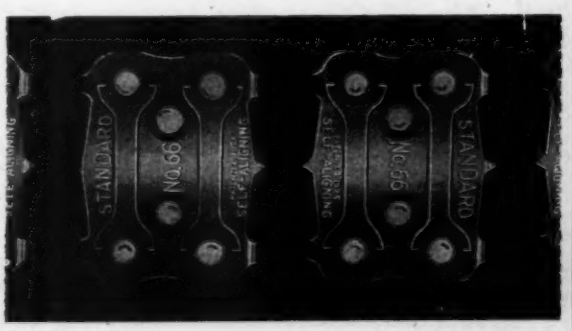
Self Aligning No. 66 are rust proof, and last indefinitely in wet or damp places, and you don't throw them away every time you take up a belt.

You need not turn your heavy wide Transmission or Conveyor belt over to clinch. Rivets may be clinched by driving against a block of metal on the underside of belt.

Send for sample fastener for comparison with what you are now using. Made for 3 to 8-ply belts.

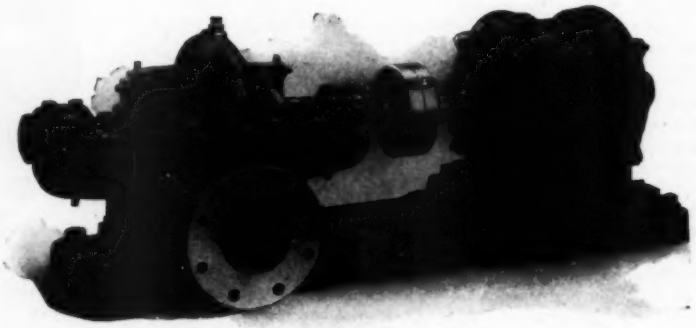
Manufactured by

THE BOURNE-FULLER CO.
UPSON WORKS
Unionville, Conn., U. S. A.

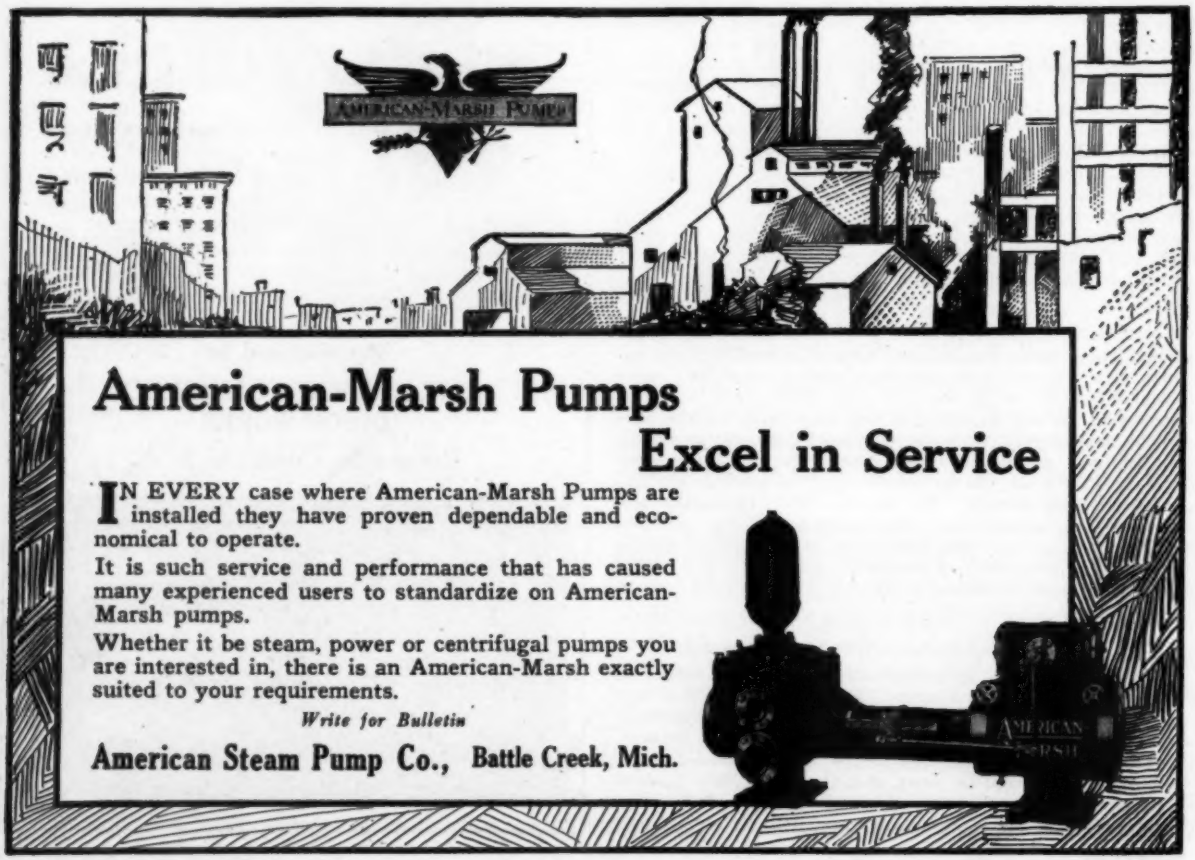


ECONOMICAL PUMPING
Will Lower Your Pumping Costs

MANY tons of water are pumped for each ton of paper made. Allis-Chalmers' improved high efficiency pumps will reduce the cost of supplying this water. If you are figuring on replacing or adding any pumping equipment it will pay to investigate the economy of Allis-Chalmers' Centrifugal Pumping Units.



ALLIS-CHALMERS
MILWAUKEE, WIS. U. S. A.



American-Marsh Pumps Excel in Service

IN EVERY case where American-Marsh Pumps are installed they have proven dependable and economical to operate.

It is such service and performance that has caused many experienced users to standardize on American-Marsh pumps.

Whether it be steam, power or centrifugal pumps you are interested in, there is an American-Marsh exactly suited to your requirements.

Write for Bulletin

American Steam Pump Co., Battle Creek, Mich.

is endeavoring to bring into a state of timber production. In addition to the 3,200 pounds an additional 2,500 pounds of yellow pine seed will be shipped later.

Production of tree seeds through the plant, the only one in the Dominion, states Edward Walmsley, Crown timber agent, has done more to bring the forest resources of British Columbia to the attention of the world than anything else. The plant will also extract large consignments of Douglas fir seed and spruce seed for reforestation in England and Scotland.

H. G. Perry, M. L. A. for Prince George, has received assurance from Hon. T. D. Patullo which points to an early start being made on the $30,000,000 pulp and paper enterprise in the neighborhood of Prince George. F. P. Jones, of Montreal, has been negotiating with the minister for some time, and there seems to be no obstacle in the way. It looks as though the work would be well under way by next summer.

Cost of Powell River Improvements

The Powell River Co. recently completed the installation of two 234-inch news machines, and the total cost in connection with this undertaking was approximately $8,000,000, apportioned as follows:

Machine room and finishing room	$2,700,000
Sawmill and wood room	1,200,000
Boiler house	900,000
Hydraulic development	675,000
Generating plant	325,000
Grinding room, screen room, water wheels, etc	720,000
Sulphite plant, acid plant, digesters and screen room	570,000
Wharf and tramways	300,000
Machine shop	80,000
Miscellaneous mill improvements	80,000
Townsite	500,000
Total	$8,050,000

The new machines bring the capacity of the plant to 450 tons of news daily, but the design is such that an increase to 500 tons is practicable.

An agreement granted by Plebiscite in New Westminster to the Canadian Rayon Pulp Co., giving a fixed assessment on Poplar Island, provided the company had expended $50,000 on improvements to the Island before November 1st, has been declared null and void. It is stated that the promoters experienced difficulty in financing the project, which was incorporated in Victoria with a capital of $2,800,000. It is said that the company will approach the city council of New Westminster at a later date for renewal of the agreement, probably for a plant on a less ambitious scale.

NEW BRUNSWICK

Judgment Handed Down in Inglewood Case

Mr. Justice A. T. Leblanc, arbitrator in the case of the claim of the Inglewood Pulp & Paper Co. against the New Brunswick Electric Power Commission, set the sum due the company at $42,500 with the costs against the company. The amount claimed had been $840,000, and the verdict has aroused keen interest in New Brunswick, the case attracting more than the usual attention because of the size of the claim.

The commission had offered $59,003.56 in return for lands appropriated in the development of power on the Musquash River. The proceedings have occupied a year and the costs of the arbitration exceed by about $10,000 the amount of the award. It is said by those interested that they will appeal from the judgment.

Satisfactory results are being obtained from the new high grade paper mill of the Fraser Companies, situated just across the United States border from their sulphite mill at Edmunston. This is a new mill which began operating at the beginning of the present year. The raw material for this plant, namely sulphite pulp, is pumped through a 5,000-foot

RYERSON

Immediate Shipment from Stock

Bars, Shapes, Structurals, Rails, Plates, Sheets, Rivets, Bolts, Nails, Wire, Chain, Turnbuckles, Shafting, Boiler Tubes, Boiler Fittings, Corrugated Sheets, Concrete Reinforcing, Welding Rods, Babbitt Metal, Tool Steel, Bar Iron, Refined Iron, Floor Plates, Safety Treads, Small Tools, Machine Tools, etc.

Write for the Journal and Stock List—the "key" to Immediate Steel.

JOSEPH T. RYERSON & SON INC.

Chicago Milwaukee Buffalo St. Louis New York Cincinnati Boston Detroit

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"Ohio" Products

Cylinder Grease
Cup Grease
Shafting Grease
Auto Grease
Journal Grease
Mine Car Grease
Graphite Grease
Mica Grease
Fibre Grease
Bearing Grease
Rope Grease
Chain Grease
Gear Grease
Gear Shield
Wool Elastic Grease
Wool Yarn Grease
Wool Waste Grease
Block Grease
Cold Neck Grease
Hot Neck Grease
Loco Rod Grease
Crank Pin Grease
Motor Oil
Engine Oil
Turbine Oil
Compressor Oil
Ice Machine Oil
Commutator Compound

Industrial Lubricants of Superior Merit

Write for Samples and Prices

Special Lubricants for Paper Mill Service

The Ohio Grease Co.
Dept. 5
Loudonville Ohio

"On the worst place you can find—

The Jenkins fair offer says:—"If you will put a Jenkins Valve on the worst place you can find, where you cannot keep other valves tight, and if it is not perfectly tight, or does not hold steam, oils, acids, water or other fluids, longer than any other valve, you may return it and your money will be refunded." Jenkins service may be obtained only from Jenkins Valves—make sure of the genuine marked with the Jenkins Diamond Mark.

Fig. 106 Screwed Jenkins Standard Bronze Globe Valve

JENKINS BROS.

80 White Street .....New York, N. Y.
524 Atlantic Avenue .....Boston, Mass.
133 No. Seventh Street....Philadelphia, Pa.
646 Washington Boulevard.....Chicago, Ill.

JENKINS BROS., Limited
Montreal, Canada London, England

Always marked with the "Diamond"
Jenkins Valves
SINCE 1864

GOULDS

INDUSTRIAL—AGRICULTURAL—MUNICIPAL—RESIDENTIAL

A Type for Every Service

GOULDS PUMPS, Incorporated
SENECA FALLS, N. Y.

PUMPS

MAGIC BOILER PRESERVATIVE

"The Pioneer Boiler Treatment"

Positively removes and prevents scale, stops minor leaks, pitting and corrosion

GARRATT-CALLAHAN CO.
310 South Michigan Avenue, Chicago

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MAGIC
ESTABLISHED 1804

1328 Broadway
New York City

VALVE MAKERS FOR OVER FIFTY YEARS

You can see it work and test it by hand

Booth 267
New York
Power Show

The Davis Pressure Regulator is distinctive in its design and its operation. It provides automatic reduction of boiler pressure to the correct service pressures for heating, auxiliaries, process uses of steam, etc., and does this by simple, reliable principle of operation.

Pressure is balanced by weight, and there are no springs, diaphragm, packing, or other details to cause trouble. The counterweighted lever makes the action of the Davis Regulator visible, and it may be tested by hand at any time. Close regulation is consistently maintained.

Send for the Davis catalogue and get the detailed description.

DAVIS VALVE
STEAM SAVERS SINCE 1875
SPECIALTIES

G. M. DAVIS REGULATOR CO., 414 Milwaukee Avenue, Chicago, Ill.

PI13—Gray

SWENSON
Reclaiming Machinery for Soda and Sulphate Mills

Also the Mount Line of Equipment, including:
Continuous Causticizing Systems, Lime Recovery Plants, Rotary Vacuum Filters, Pulp Washers, Calcining Furnaces, Molten Caustic Equipment, Caustic Flakers, Dryers.

Evaporators—Leaching Batteries
Incinerators—Digesters, etc.
Send for Folder P-123
See pages 402-403 in the 1926 Paper and Pulp Catalogue
SWENSON EVAPORATOR CO.
[Subsidiary of Whiting Corporation]
Main Office and Works: Harvey, Ill. [Chicago Suburb]
Sales Offices in New York, Chicago, Buffalo, Detroit and San Francisco

PI12—Gray

pipe-line from the Edmunston plant. The capacity of the new mill is about 80 tons daily of high grade paper, made on two machines. They are capable of producing various types of the finer sulphite papers, and the mill varies its output with the position of the market.

The sale of S. H. White Company's assets was made recently through foreclosure of a trust mortgage by the Eastern Trust Co. as trustee. The assets included pulpwood areas in four New Brunswick counties, timber leases, several sawmills and a small rural telephone company known as the Little Salmon River Telephone Co.

Although since early in the summer the plant of the Nashwaak Pulp & Paper Co., of Fairville, has been operated on the basis of four days per week, the outlook is that the mill will soon return to normal conditions.

NOVA SCOTIA

Frank J. D. Barnjum, well known for his work in support of forest conservation, announced last spring that he was offering $1,000 in prizes to the Chief Forest Rangers showing best work in forest fire protection during 1926. The forest fire season is now over, and Mr. Barnjum's gift, divided into three prizes, has been awarded as follows:

First Prize, $500, Geo. S. Dickie, Middle Musquodoboit, Halifax County.

Second Prize, $350, Harold B. Verge, Barss Corner, Lunenburg County.

Third Prize, $150, W. B. Fraser, Waternish, Guysboro County.

Barnjum Cites Advantages of Province

Mr. F. D. Barnjum, of Annapolis Royal, was in Montreal recently, calling upon some of his friends. When asked if the projected newsprint mill at Liverpool, N. S., had been given up, Mr. Barnjum stated that, far from it, satisfactory progress is being made with the preliminaries, and that the mill will eventually be built. Mr. Barnjum maintains that Nova Scotia offers the best opportunities for a successful paper mill of any part of Canada, its distinctive advantages lying in its all-the-year-round salt water navigation, its climatic conditions, which make it an ideal wood-growing country, its favorable labor conditions, and its proximity to the big American cities and the paper market generally.

As to its wood supply, Mr. Barnjum is of the opinion that Nova Scotia will have an abundant crop of pulpwood long after that of the other provinces has been exhausted, particularly since the local government has at last seriously taken up the question of its adequate conservation.

Text Book on Arc Welding

"Arc Welding, The New Age in Iron and Steel" is the title of a 160-page text book which has been published recently by the Lincoln Electric Company, of Cleveland, Ohio.

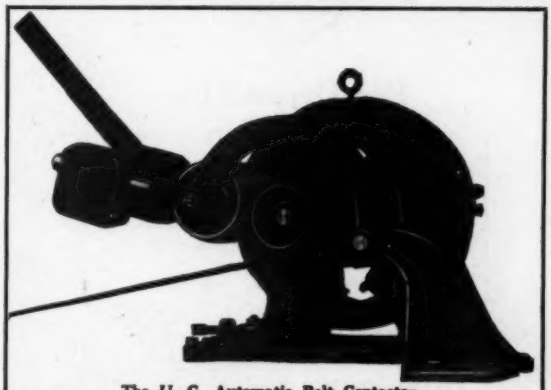
This book is devoted largely to the use of arc welding in general production manufacturing and in this connection points out that there are two main fields for production welding. The first is the use of arc welding in place of riveting. The book demonstrates that a welded joint can be 100 per cent efficient, whereas a riveted joint can never equal the strength of a welded one.

The second field is the substitution of arc welded steel for cast iron. It is claimed that 90 per cent of the iron castings now used could be replaced by arc welded steel at a decided saving. The opening chapter, which discusses the superiority of steel over iron from both the standpoints of strength and economy, has an addenda of a technical discussion of this subject with diagrams and references to recognized authorities.

The book throughout contains a wealth of illustrations, charts and diagrams of each of the points brought out which help to present the subject matter clearly and intelligently.

The price of the book is $1.50, 6 by 9 inches, and is nicely bound in imitation leather.

Proved Results Instead of Experiment



The U. G. Automatic Belt Contactor

WOOD'S SHORT CENTER BELT DRIVE

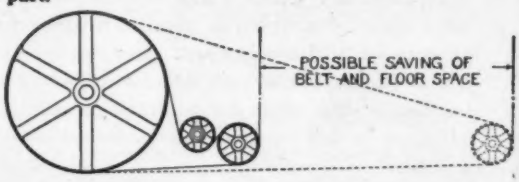
When you buy a Wood's Power Transmission Appliance you are not buying an experiment but a proved result of long lasting economy—a result that carries with it the experience of 70 years in solving power transmission problems.

For example, the Wood's Short Center Belt Contactor is a power transmission machine with distinct money saving, power saving, appeal. Saves belts, saves power, saves floor space. The increased arc of contact illustrated below shows how you get full power transmission with this Short Center Belt Drive—and that means big power and belt savings over the old method.

Wood's Short Center Belt Contactor is successfully and economically serving many and varied industrial plants throughout the United States. It will in your plant, too.

There's a Wood's Dealer near you who can quickly and efficiently supply your power transmission needs. Get acquainted with him. He's a worthwhile man in your community and he's reliable.

Just ask him how you can effect savings with this present day power transmission need. He'll be glad to tell you—and prove it—without obligation on your part.



T. B. Wood Sons Co.
Chambersburg, Pa.

NEW ENGLAND BRANCH: Cambridge, Mass. SOUTHERN BRANCH: Greenville, S.C.

Makers of Power Transmission Machinery Since 1857

Shafting, Cast Iron Hangers, Pulleys, Flexible Couplings, Friction Clutches, Short Center Belt Drives, Hanger Boxes, Pillow Blocks, etc., equipped with or without Wood-Fafnir Ball Bearings.

ALBANY GREASE

For Dependable Lubrication

Paper plant machinery function best when lubricated with Albany Grease. Always uniform—never drips. Sold in cans and barrels—all consistencies.

Demand Albany Grease—look for the Trade-Mark.

Your dealer can supply you. If not, write us.

ADAM COOK'S SONS
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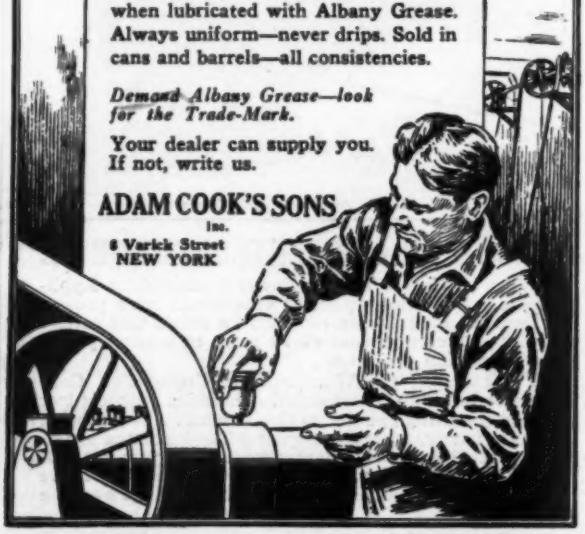

WALDRON

Kalamazoo Center Rewinder

Choice of Mills that seek maximum efficiency in operation and economy of power cost.

For detailed information regarding any of the Waldron Machines for Paper Converting and Processing—write without obligation—to

JOHN WALDRON CORP.
New Brunswick, N. J.

Builders, Since 1827, of Quality Machines for Embossing, Coating, Printing Paper and Textiles — Calenders, Winders, Slitters — Festooning Machines for Paper and Fabrics. Special Machinery.

MACHINES

Why Not *Try* This Positive Protection?

In the plant of the Laurentide Co., Ltd., and in many other pulp and paper mills, BITUMASTIC SOLUTION is used to protect plant structures and equipment. It protects these metal surfaces, not only against moisture and hot vapor, but against the attack of acids and alkalies—a job to which no ordinary paint is suited.

Why permit your plant equipment to corrode and to depreciate in usefulness and value? Why go to the expense of frequent cleaning and repainting—a process in which labor is more costly than the paint? BITUMASTIC will assure year-in year-out protection in the face of all conditions which defy an ordinary paint or coating in a paper mill. Why not *try* this positive protection? Order one 5-gallon can or 30-gallon drum and return the unused portion if it fails to satisfy in any way whatever.

SINCE **BITUMASTIC** 1854
REG. U.S. PAT. OFF.

WAILES DOVE-HERMISTON CORPORATION
17 BATTERY PLACE, NEW YORK
322 S. Delaware Ave., Philadelphia — Union Trust Building, Cleveland
Matson Building, San Francisco
In Canada—Lytle Engineering Co., Montreal
Agents in principal cities

Catalogs, Booklets, Etc.

William Ganschow Co., Chicago, Ill.—A small booklet recently published tells the story of this company since its organization. The origin, progress policies, etc., are briefly dealt with.

General Electric Co., Schenectady, N. Y.—Fabroil and Textolite gears form the subject matter of bulletin No. GEA-482 recently issued. The construction of these materials, their characteristics and their manufacture into gears are completely dealt with. A great deal of useful application data will prove very useful when ordering and using these gears, as will a number of tables and charts.

Ingersoll-Rand Co., New York City.—The new and revised edition of the Cameron Single-stage, Double-Suction Volute Pump Bulletin Form No. 7059 is now available. The pumps are described in detail, dealing with one section or part at a time. There are numerous illustrations, cross-sectional views in two colors, pictures of the pumps themselves, and a number of installation views.

La Motte Chemical Products Co., Baltimore, Md.—"The A B C of Hydrogen Ion Control" is the title of a new catalog. The catalog contains: first, a non-technical discussion of the meaning of hydrogen ion concentration and pH values; second, a technical discussion for the chemist, bacteriologist, engineer, etc.; third, the application of pH control to over twenty different types of work, such as paper manufacture, general chemicals, water purification, sewage disposal and others, and fourth, a complete description of the various types of equipment for colormetric work together with full instructions for making determinations under all conditions. The booklet is not alone a catalog, but also a treatise on hydrogen ion control and will make a valuable addition to the library of any chemist, engineer, etc.

Merco Nordstrom Valve Co., San Francisco, Calif.—Catalog No. 5 describes and illustrates the Merco Nordstrom Plug Valves. Each particular style of valve is completely covered by a number of illustrations, charts and diagrams, making the presentation very clear and inclusive. Instructions for ordering and a recommendation chart for correct lubrication form an important part of the catalog.

Metropolitan Life Insurance Co., New York City.—Number four of that excellent series on Business Organization which this company is publishing, is entitled "The Industrial Traffic Manager." As in the rest of the series, here is an intelligent, thorough summary and explanation of the duties and organization of an important executive and his department—in this case the Traffic Manager and the Traffic Department. From this concern has also been received the first of a new series dealing with labor turnover problems, entitled "The Moving Finger Writes." The experiences of several hundred companies in dealing with labor turnover are incorporated in this first booklet.

Phillips' Paper Trade Directory of the World.—The 1926-7 edition of this directory is now available. As previous editions have been, this is as complete and as near accurate as possible reference work relating to paper and paper-making and the allied industry as could be compiled. Quite a number of changes have been recorded, bringing the work up-to-date. An important feature continued in this issue is the index to advertisers, in which will be found references to the principal paper machine and pulp-making machinery engineers. The price of the book is twenty-one shillings and copies may be secured from S. C. Phillips & Co., 47, Cannon St., E.C. 4, London, England.

Quigley Furnace Specialties Co., New York City.—"Hytempite in the Power Plant" is the newest bulletin from this concern. It illustrates and describes some of the many successful applications of Hytempite in fire brick masonry. Methods for rebuilding and patching furnace walls are given and illustrated, and the uses of the Quigley Refractory Gun for applying plastic refractory materials are given in detail.

C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.—The latest edition of the Tag "Codex" is just off the press. In keeping with former editions this is a most intelligible catalog of industrial thermometers. The material is arranged in an orderly, easily read manner and the illustrations are a great aid in the presentation. Complete instructions for ordering thermometers for all purposes are contained in the catalog.

ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING
Steel end your Belts
and use sectional hinge pins of steel
JUST A HAMMER TO APPLY IT
BELTS steel-ended with Alligator Steel Belt Lacing and joined with Alligator Sectional Steel Rocker Hinge Pins are exempt from most belting troubles.
This smooth hinged lacing gives long, efficient service on all kinds and sizes of belts. Use Alligator Steel Belt Lacing confidently on your belt drives.
Consultation invited. Sold the world over by the belting, mill supply and hardware trades.
Flexible Steel Lacing Co.
4675 Lexington Street
Chicago, U. S. A.
In England at
135 Finsbury Pavement,
London, E. C. 2

Approved for Paper Mill Service
Stanley
Solid Woven Cotton Belting
The Solid Woven Belt
That Does Not Stretch
Stanley Solid Woven Cotton Belting does not stretch any more than any other type of fine belting. One small take up after a few hours' running—and sometimes a second take up later on. That is the extent of the stretch.
The long staple cotton is absolutely impregnated with a dressing that prevents absorption of moisture and largely overcomes the feature of expansion and contraction.
In service where exposed to moisture, acids, alkalis, dust, oil, extreme heat and cold, thousands of Stanley belts are giving excellent results.
Let us quote you, send small samples and give you names of users in paper mills. Write.
Stanley Belting Corporation
320 Broadway
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124 Adelaide St., W.
Toronto, Ont.
STANLEY BELTING
MADE IN SCOTLAND
17 N. Jefferson St.,
Chicago
42A Southwark St.,
S. E. 1.
London, England

Note the Table of Contents

110 pages of bearing data, recommendations and *knowledge*, based upon experience with 160,000,000 successfully applied bearings! That's the new Timken Engineering Journal, complete with figures and facts which are governing the adoption of Timken Bearings for every type of mechanical device, throughout industry.

New curves of endurance, output, and economy are being charted by means of Timken tapered design, Timken *POSITIVELY ALIGNED ROLLS*, and Timken-made steel, among the many Timken features. The Timken Engineering Journal tells exactly *why* and *how*. Your request on your letterhead brings your copy.

THE TIMKEN ROLLER BEARING CO., CANTON, O.

Technical information regarding bearing sizes and their mountings can be secured from the Timken Roller Bearing Service & Sales Company's Branches located in the following cities: Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, Newark, New York, Omaha, Philadelphia, Pittsburgh, Richmond, St. Louis, San Francisco, Seattle, Toronto, Winnipeg.

BRITISH CORRESPONDENCE

Present Trade Conditions

Papermaking materials were among those exports in which advances were made during the month of October, while the figures for paper also show some improvements. The following details indicate the values and quantities, with increases and decreases as compared with the same month of 1925.

Values:	Oct., 1926	1925	1924
Papermaking materials	£149,581	Increase of £ 3,876	Decrease of £17,179
Paper and cardboard	955,153	Decrease of 23,135	Increase of 97,680

Quantity:	Oct., 1924	1925	1926
Papermaking materials	14,390 tons	13,599 tons	16,158 tons
Paper and cardboard	439,135 cwt.	506,693 cwt.	462,733 cwt.

The following are the import values and prices for the same products:

Values:	Oct., 1926	1925	1924
Papermaking materials	£ 876,997	Decrease of £ 25,672	Decrease of £215,458
Paper and cardboard	1,282,400	Decrease of 172,218	Decrease of 129,513

Quantity:	Oct., 1924	1925	1926
Wood pulp (tons)	127,014	101,327	93,253
Paper (cwt.)	1,364,751	1,423,177	1,312,062

In the woodfree section, foreign competition, especially German, is keen, but, in spite of this, there is a better demand for British papers than there has been for some time. Esparto manufacturers are busy and bookings have been made for a considerable period ahead. At the beginning of November, Scotch esparto manufacturers decided to increase the price of all their papers by ½d. per pound; the reason for this decision being the increased cost of coal and chemicals, and of transport and other expenses arising from the use of inferior substitutes. In view of the anticipated early resumption of activities in the coal mines, this move is considered in some trade circles to be ill-advised, for it is expected that even before coal prices and supplies approach normal, that some of the independent concerns will break away and supply at the old figure. It is considered, too, that this increase in prices will cause many users to employ substitutes in the form of wood and esparto papers made in the British mills.

The demand for home products in the wrapping paper section is increasing, and foreign imports are showing signs of a correspondng decrease. Many mills which did not, prior to the imposition of the tariff, manufacture wrappings, are now turning their attention to this material; but it has been pointed out recently by an expert that there is an element of danger in the situation if too many mills begin to look to wrapping paper business to carry them through, for despite the tariff, foreign competition is still formidable in some directions, and there is a limit to home demands.

Board of Trade returns show that our paper and board exports for the first nine months of this year are slightly down in tonnage; but there is a slightly increased value over the corresponding period of last year. Printing papers were the largest item on our exports, writings were next in importance, while packings and wrappings are third on the list.

Early Change to 1,000 Sheet Basis Requested—A new booklet containing the tables that have been issued at various times, and setting forth the advantages of the standardization of paper and the best way of using the methods recommended by the Federation of Master Printers, was issued by the Costing Committee of that body last month. In an introductory note by the chairman and secretary, it is pointed out that time is necessary in order to enable the wholesale stationers to convert their stocks and price lists to the 1,000 sheet basis, and to allow printers to become conversant with the new methods. It is suggested that the period of transition would be shortened, if every master printer would at once adopt standardization in all his dealings in paper, and the printing and paper trades would then feel how great were the advantages of uniformity. It is interesting to know that the printers' organization in the United States standardized on 1,000 sheets about twelve months after this scheme had been approved by the Federation of Master Printers of Great Britain and Ireland.

It is understood that master printers who are now working on the 1,000 sheet basis have found many advantages in this new method. Calculations in estimates, cost sheets, and so on,

Pioneers in Paper Making

BELIEVING it will interest our friends to know something of the pioneer paper makers of America, brief notes of the earliest paper mills in different parts of the country will be recorded below from month to month.

A Pioneer Mill in Kentucky

Although the State of Kentucky no longer contains any paper mills, it is interesting to note that the first paper mill built west of the Susquehanna River was within her borders. The project was started at Georgetown, Kentucky, in 1791, by the Rev. Elijah Craig, a Baptist preacher, and his partners, Parker & Co., but according to Collin's History of Kentucky they were not successfully manufacturing paper until 1793.

The mill building was a modest affair 40x60 feet in size, with a stone basement and a wooden superstructure of two and one-half stories. Yet in a community so far removed from any other source of supply, this infant industry had an importance out of proportion to its size. It supplied the paper for the Kentucky Gazette of Lexington, the Western Spy of Cincinnati and other newspapers of that section, and is referred to by historians of early Kentucky days as having been of important assistance to the business life of the time.

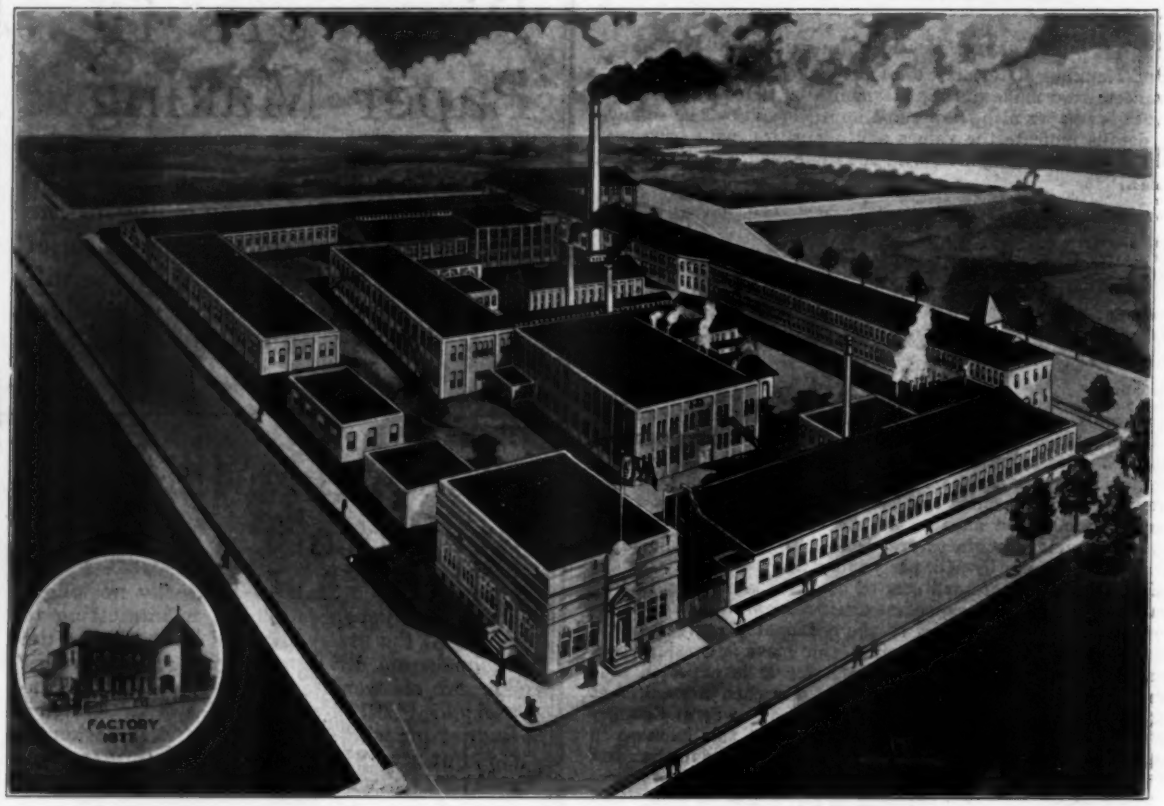
Established 1842

Cheney Bigelow Wire Works

Experienced and Progressive

Fourdrinier and Cylinder Wires
Dandy Rolls and Cylinder Moulds
made and recovered

SPRINGFIELD, MASSACHUSETTS



This illustration Visualizes Forty-nine Years of Progressive Growth and Unsurpassed Achievements in the Production of

EASTWOOD

FOURDRINIER-CYLINDER-WASHER

WIRES

EASTWOOD WIRE MANUFACTURING CO., BELLEVILLE N.J. U.S.A.

are simplified, the keeping of records of paper stocks is easier, and the possibility of errors in the quantity when giving out paper is considerably reduced, by working on the basis of 1,000 sheets.

The standardization of paper and boards in this country was inaugurated by an agreement between the Federation of Master Printers of Great Britain and Ireland, and the National Association of Wholesale Stationers and Paper Merchants in July, 1925, when it was agreed that all paper and boards should be sold by the thousand sheets and packed in 1,000s, 500s, 250s, and 100s, according to size and weight. Further stipulations were also included as to standard names and sizes, special markings, and so on. A series of tables have been issued by the Federation, indicating prices for quantity required at price per thousand sheets, equivalent weights of printing and writing papers, and so on.

V. D. Simons, mill engineer and architect, who engineered the immense reconstruction and rehabilitation program of the Bryant Paper Co., Kalamazoo, announced recently that the betterment program at the Bryant mill will be continued during 1927. The Bryant division finishing room is to be completely overhauled and re-equipped, power facilities are to be increased by the addition of a generator, with added boiler capacity later. There is also considerable work to be done at the Imperial coating division.

MICHIGAN NEWS

William A. Anderson Joins Allied Mills Staff

A. G. Gilman, president of the Allied Paper Mills, announces the engagement of William A. Anderson as production manager and in charge of manufacture at the company's various divisions. While his headquarters are in the company's general offices, his tasks will require considerable time in Otsego.

Mr. Anderson is not unknown to the fraternity of Kalamazoo paper makers. Years ago he ran a machine at the Bryant Paper Company and rose to the position of boss machine tender. He resigned to accept a better position with the Monadnock Paper Company, Bennington, Vt., later returning at the solicitation of the late Frank H. Milham to assume charge of the construction and running of the Milham division. He held this position for three years.

Leaving the Bryant Paper Company, Mr. Anderson returned to Canada, where he first learned the art of paper making. He assumed the position of mill manager and general superintendent of the Kinleith Paper Mills, remaining with that concern for ten and a half years, when the plant was absorbed by the Howard Smith Paper Co., Mr. Anderson then became superintendent of the company's Crabtree mills.

Mr. Anderson returns to Kalamazoo backed by a highly successful record.

It was twenty years ago last month that production started in the Monarch Division of the Allied Paper Mills. The operating concern was then known as the Monarch Paper Company, and George O. Comfort was the president. This plant, a three-machine mill, was erected on the site of the old Kalamazoo Paper Company, the first mill erected in the Kalamazoo River Valley district. This property had been transferred to the Gibson Paper Company and in turn was sold by that concern to the Monarch Paper Co. interests. The late George Clark, at the head of the Clark Engine and Boiler Company, was the heaviest investor in the Monarch concern.

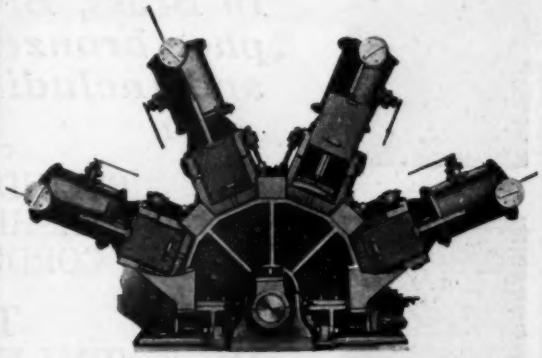
Superintendents Hold Monthly Meeting

The regular monthly meeting of the Michigan Division of the Superintendents' Association was held at the Park American Hotel in Kalamazoo on Thursday evening, November 18th. This was their yearly problem gathering.

The problems started at the meeting when Mr. Redmond, general superintendent at the Kalamazoo Paper Co., asked Mr. Gilman, superintendent of the Bryant Division of the Bryant Paper Co., how his new machine was running.

Mr. Gilman answered: "Gentlemen, we are now filling

"Repeat Orders Are the Best Indorsement"



International Grinders

Built with either three or four pockets — heavy construction throughout.

Pockets held in position by two large steel bolts—bridge trees extra heavy.

Pockets large in size, so that frequent refilling is unnecessary.

Save-alls below outside pockets catch all pulp when pockets are opened.

Special tapered bronze bushings —thread on inside only.

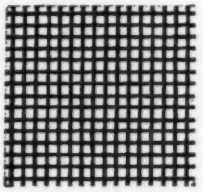
Bearings very large—wedge adjustable.

Equipped with Barker valves which are designed so that they stay tight.

GREEN BAY BARKER COMPANY
GreenBay Wisconsin
"Machinery Manufacturers"

FOURDRINIER WIRES

In Brass, Bronze and phosphor bronze, widths up to, and including 250 inches.



Also

CYLINDER FACES
WASHER WIRES
and CORDUROY CLOTH

THE
W. S. TYLER COMPANY
Cleveland, Ohio, U. S. A.

THE DRAPER FELT

Unexcelled for strength, openness, resiliency, and general running qualities. Made to meet the most exacting conditions on all types of machines and all kinds of papers. Only one grade and that the highest.

Made by

DRAPER BROTHERS COMPANY

CANTON, MASS.

Woolen Manufacturers Since 1856

REPRESENTATIVES

L. H. BREYFOGLE, Kalamazoo, Mich. INTERNATIONAL TRADING CO., Philadelphia, Pa.

orders from our new machine, and she certainly is a dandy. I think we did remarkably well from the 15th of March, when we started work on this machine, till the 3rd of November, when we put the paper over it, everything went like clockwork. Of course, we had minor difficulties, but we are now filling orders from this machine."

Mr. Alfred Bryant, of the Milham Division of the Bryant Paper Company, brought up the question of forgetting. He asked what the rest of the men were doing to overcome this difficulty.

Mr. Emil Yahnke, of the Standard Paper Co., came out with an interesting solution of this problem when it comes to water on their breaker beater. He stated that before this they were having trouble with the correct amount of water in this beater, one man would have too much and the other too little, making a variation in weight. They watched and found the correct amount of water, and put a wheel valve on the water line, and locked it open at this point. These men could not forget, because the system was automatic.

This was considered by all present an excellent problem meeting.

Those present were: Bernard Benson, Williams Gray Co.; Wm. Sievert, Michigan Carton Co., Battle Creek; George Pountain, Allied Mills; L. M. Mongreig, United States Rubber Co.; Clarence Harted, Rex Paper Co.; E. H. Gilman, Bryant Paper Co.; M. C. Mulder, Thos. Wallington, Martin Mulder, Wm. Carroll, Jack Spoor, Allied Paper Mills; Homer Stafford, Hawthorne Paper Co.; W. E. Smith, Michael Redmond, Kalamazoo Paper Co.; Alfred Bryant, Bryant Paper Co., and Emil Yahnke, Standard Paper Co.

Watervliet Receives New Machine

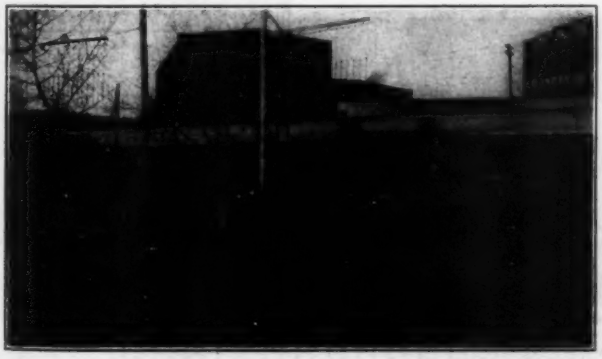
The new paper machine that constitutes the largest single unit in the three-quarters of a million dollar expansion program which the Watervliet Paper Co. has had under way for nearly a year, has been shipped from the J. H. Horne and Sons Company, paper machine builders of Lowell, Mass.

The new machine, which is 120 inches wide, is a fast running fourdrinier and embodies all the latest improvements. It was designed particularly for the manufacture of raw stock for coating and is capable of running at a maximum speed of 700 feet a minute.

The enlargement of the Watervliet mill will increase the plant's production two and one-half times, and when the new machine operates, the Watervliet Paper Co. will manufacture all their own raw stock for coating.

264-Inch Calender Rolls

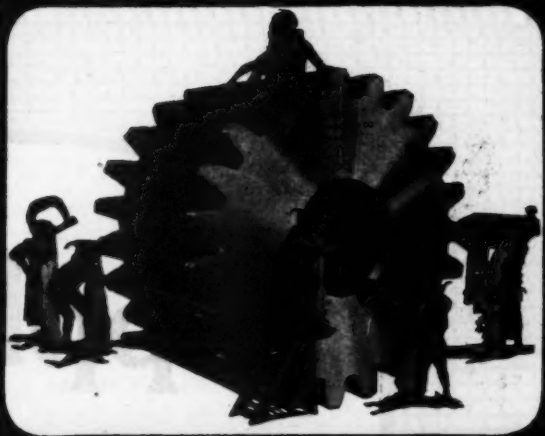
The Farrel Foundry & Machine Co., Ansonia, Conn., has just shipped a stack of chilled iron rolls which measure 264 inches on the face and which are believed to be the largest rolls



of the kind ever made. The rolls are to be used for calendering paper in a large paper mill in Canada.

The above picture shows the complete stock of rolls loaded on three freight cars and an idea of the size of the rolls can be imagined when it is noted that the bottom roll, which is 34 inches in diameter, takes up almost the entire length of a freight car. The shipping weight of this particular roll was

Ganschow



Accuracy

Fabroil (a General Electric product) is a compressed cotton fibre that does not deteriorate with age and is not subject to heat or cold, dryness or dampness.

That noisy waste of metal grating against metal is wholly unnecessary and is overcome by the use of Fabroil Gears and Pinions, which absorb vibration and shock in gear trains.

Fabroil noiseless gears are as strong as the best cast iron and cushion equally well with cast iron, steel or bronze mating gears. They can be run in a bath of oil.

We suggest and recommend Fabroil motor pinions be placed in your stock to avoid unnecessary and costly breakdowns that are bound to occur with short-lived non-metallic gears and steel pinions.

If you want ten years or more of unfailing service, Ganschow can promptly fill your exacting requirements with Fabroil Gears and Pinions.

William Ganschow Company

1015 West Washington Blvd Chicago

NEW YORK ST. LOUIS TAMPA MILWAUKEE MINNEAPOLIS
BOSTON HOUSTON RALEIGH CLEVELAND BIRMINGHAM SAN FRANCISCO
DETROIT SEATTLE ST. PAUL PITTSBURGH PHILADELPHIA SALT LAKE CITY

Ganschow

Appleton

Fourdrinier Wires

Cylinder Wires

Save-All Wires

Washer Wires

In Brass and Phosphor Bronze

"Appleton Wires Are Good Wires"

APPLETON WIRE WORKS, Inc.
Appleton, Wis., U. S. A.

50,300 pounds while the shipping weight of the entire stack, consisting of eight rolls, was 236,000 pounds.

These rolls were made in their entirety at the Farrel works in Ansonia and were handled through the Farrel shops by gigantic overhead electric traveling cranes. Each roll was ground to a glass-like finish in specially constructed roll grinders of the Farrel make.

PACIFIC COAST NEWS

The Pittock Leadbetter Company has been incorporated at Camas, Wash., as a pulp, paper and logging company. F. W. Leadbetter, L. L. Leadbetter and Pittock Leadbetter will manage the company. The company will issue stock to a value of $10,000.

A 133-inch machine to manufacture light, good quality cardboard, believed to be the largest of its type ever constructed, has been ordered by the Longview Fibre Co. for its $2,500,000 paper plant project at Longview, Wash. The order was placed with the Black & Clawson Co., Hamilton, Ohio, and delivery is expected within six months. Two or three months will be required to erect the machine, which is expected to produce 100 tons of sulphate linen a day.

The Jones-Best Pulp Co. has been incorporated at Aberdeen, Wash., for $100,000. H. E. Best and Guy H. Allison are the incorporators.

Possibility that the Fidalgo Pulp Manufacturing Co., Anacortes, Wash., may double its capacity is announced by Dr. S. G. Brooks, mayor of the city. An inadequate supply of water has hindered expansion the past year. The company has made an offer to the city for additional water and has suggested a plan for financing improvements needed to provide a greater supply.

Installation of machinery is under way at the St. Helens Pulp & Paper Co. mill, St. Helens, Ore., and it is stated that the plant will begin operations the first of the year. Approximately 170 men are employed now in construction work, and when the plant starts up, this force will be increased to 200. The pulp and paper output will be sixty tons a day.

The 250-foot concrete stack at the Reed-McCleary power plant is completed and being lined with brick and a new battery of three large boilers is being erected, doubling the power capacity of the plant, to be ready to supply current and steam for the new paper mill of the Rainier Pulp & Paper Co., Shelton, Wash., by April. The main building of the paper mill is now up to the seventh story, and the first two digesters, said to be the largest ever made, are being installed.

Approximately 2,200 cords of waste boxwood, 600 tons of lime rock and 200 tons of sulphur will be used monthly by the San Juan Pulp Manufacturing Co., which began operations October 6th, at Bellingham, Wash. When both digesters are operating, as they were by the end of October, 125 men are employed.

The Chamber of Commerce, Seattle, has completed plans for a comprehensive survey of pulp and paper resources. Recent growth of the industry prompts the survey.

Activity Stimulated in Alaska

New government regulations have stimulated activity in the pulp industry of Alaska, Brice Howard, agent at Juneau, declared while in Seattle recently. I. and J. D. Zellerbach, of San Francisco, have applied to the Federal Power Commission for a preliminary permit for water power projects on eight creeks and lakes on Revillagigedo Island to develop power for a pulp and paper mill.

William Randolph Hearst has filed an application at Washington with the Federal Power Commission for a preliminary

Starch

ECONOMY can never be mistaken for cheapness. In the matter of sizing material, starch is cheaper than an all-glue size, yet the results are identical—in fact, the paper made with starch sizing is stronger.

FOX HEAD NIAGARA SPECIAL PAPER

Our experts can show you how these starches can be used advantageously in your mill. They will gladly call on request.

Corn Products Refining Company
17 Battery Place New York

Starch

FOR ALL PAPERS—
A Fitchburg Felt

¶ For whatever paper you make, whether fine ledger or bond, book, or coarse paper, Fitchburg Felts give long and efficient service.

¶ Fitchburg Cotton Dryer Felts are made in two, three, four, five and six ply in English weave, from 60 to 210 inches in width.

¶ For over eighty years paper makers have bought Fitchburg Felts in full confidence, knowing that every ounce conforms to the highest standards of quality and workmanship.

¶ When next thinking of dryer felts, think of "Fitchburg."

FITCHBURG DUCK MILLS
ESTABLISHED 1844
54 Duck Mill Road FITCHBURG, MASS.

THE WATERBURY FELT CO.

SKANEATELES FALLS

New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

They Satisfy

IF WE CAN MAKE RUBBER PRESS ROLLS (Snappy and Tough)

THAT TAKE MORE WATER OUT
THAT ARE EASIER ON THE FELTS
THAT STAND UP BETWEEN GRINDING

Longer than the ones you are using, it will pay to send your rolls to us if you are three thousand miles away. Some mills are doing this.

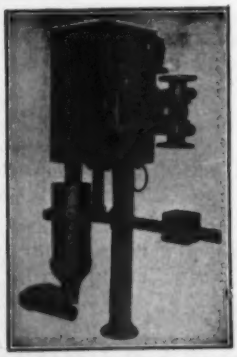
STOWE & WOODWARD COMPANY

The Rubber Roll Makers NEWTON UPPER FALLS, MASSACHUSETTS

DON'T WORRY OVER WEIGHTS!

Write to TRIMBEY

Used Wherever Paper is Made



More Than 500 In Operation

"Made in Canada"

Agencies in Principal European Countries

TRIMBEY MACHINE WKS.

Glens Falls, N. Y.

LOCKPORT Felts

EXCLUSIVE MAKERS OF

Paper Makers' Felts

Have You Run Them?
If Not, Why Not?

Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service

LOCKPORT FELT CO., Newfane, N. Y.

permit to construct a power project in Alaska for the manufacture of paper. Hearst contemplates a project at Port Snettisham in the Tongass National Forest and a complete paper and pulp mill.

A report recently issued by the Los Angeles Harbor officials reveals the fact that during the last fiscal year 32,512 tons of paper and paper products were exported, to a value of $1,626,296. Practically all of this was the product of Los Angeles institutions.

Work on the projected board mill and folding paper box factory of the Zellerbach Paper Co., now under construction at Southgate, a suburb of Los Angeles, is progressing rapidly. Victor E. Hecht, assistant manager of the company, says the side walls are being pushed up and if the work of construction is not too much delayed by the rains incident to the annual Southern California rainy season, now under way, the plant will be completed at an early day.

Driving of piles for the foundation of the building that will house the larger paper machine, the Hart Construction Co., of Tacoma, has taken the first big step towards completing the West Coast Pulp & Paper Co., Tumwater, Wash., mill by early spring, according to H. S. Gile, secretary of the corporation. The new building will measure 300 by 75 feet when completed and will be so constructed that additions can be made at a minimum cost when a second paper machine is added.

The Merging of Leadbetter Mills

On November 20, the Columbia River Paper Mills, organized under the laws of Delaware, received a permit from the state corporation department to operate in Oregon. A week later, directors met and discussed briefly the proposal to take over the stock of the Oregon Pulp and Paper Co. at Salem, Ore., the Columbia River Paper Mills, at Vancouver, Wash., and the California-Oregon Paper Mills, in Los Angeles, California.

While no definite plan has been announced as yet, it is reported that the corporation would eventually absorb the physical properties of the three manufacturing concerns. Another meeting is to be held within the next few weeks, when the proposed merger will be discussed at length.

The new corporation has 120,000 shares of stock, including first preferred, second preferred and common. The capital stock is said to be worth $60,000,000.

Officers in the organization are: F. W. Leadbetter of Portland, president; W. B. Dubiver, Vancouver, vice-president; Hamilton F. Corbett, Portland, treasurer; A. S. Fleming, Portland, and N. D. Simon, Portland, attorneys. Directors are: F. W. Leadbetter, Louis Leadbetter, W. B. DuBois, Carl Beyerly, B. L. Stevens, A. S. Fleming, Pittock Leadbetter and J. J. Donovan. F. W. Leadbetter holds a controlling interest in the three paper mills.

Ernest Schweitz, an engineer who has had experience in constructing and operating paper mills in Sweden, has prepared plans for the Spaulding Pulp and Paper Mill in Newberg, Ore., and Joseph Kaster will direct the construction. Kaster was formerly superintendent of one of the Crown Willamette Paper Company's mills. The mill will specialize in the production of high grades of sulphite paper.

The Hammermill Paper Co., Erie, Pa., announces the appointments of Mr. C. W. Chabot as director of distribution, and of Mr. H. W. Baldwin as manager of sales. The position of director of distribution was created in order to bring all merchandising activities under one direction. Mr. Chabot will continue as advertising manager.

Dr. W. A. Taylor, President and Chemical Director of the La Motte Chemical Products Co., Baltimore, spoke before the Miami Valley Division of American Pulp and Paper Mill Superintendents' Association at Middletown, Ohio recently. The subject of his address was "The A B C of Hydrogen Ion Control in Pulp and Paper Manufacture."

DEPENDABLE EQUIPMENT

FOR over thirty years Norwood Paper Mill Equipment has had the reputation of being built up to a quality standard. Constant improvement has done away with the necessity of drastic changes—and dependability is an inbuilt quality which you are as sure to find as the name-plate on each piece of equipment. Norwood paper mill equipment is built to stand up and give you long, honest and satisfactory service.

NORWOOD WATER FILTERS offer so many outstanding superiorities and money saving features that it is distinctly to your advantage to make a thorough study of these filters before closing bids on any contemplated installation. Complete catalogs as well as assistance from our engineering staff are yours for the asking.

NORWOOD PAPER MILL MACHINES—super-calenders, glassine-calenders, platers, dusters and brushing engines—are all leaders in their respective fields — each with many distinctive superiorities. No matter what installations or additions of paper mill machinery you are contemplating, you will find it to your advantage to have Norwood specifications and prices before placing your orders.

Catalogs, photographs, specifications and expert engineering assistance will be gladly furnished

NORWOOD ENGINEERING COMPANY

Florence, Mass.

SIMONDS

Barker and Chipper KNIVES

Tough steel of edge-holding quality, backed by expert workmanship, makes Simonds Knives the most serviceable for pulp and paper mills.

Write for Catalog and Prices

See page 393 in the 1926 Paper and Pulp Mill Catalog

Simonds Saw and Steel Co.

Established 1832 FITCHBURG, MASS.
Boston, Mass. Chicago, Ill.

Hungerford Filters *for* Clear Water

Hungerford Softening Filters *for* Soft Water

Hungerford & Terry, Inc.
Clayton, N. J.

ROEPER ELECTRIC HOISTS

As Strong as Twenty Men
As Accurate as One

When you pull on the cord the ROEPER TYPE "R" Electric Hoist goes to work with the strength of twenty men, right under your guidance. Unsurpassed for handling paper rolls, calender rolls or other heavy lifting.

SEND FOR BULLETIN

ROEPER CRANE & HOIST WORKS, Inc.
1724 North 10th Street READING, PA.

POWER PLANT PIPING

We are fully equipped to supply fabricated materials and to install complete piping systems for Electric Power Stations, Blast Furnaces, Steel Mills, Coke Works, Paper Mills and Industrial Plants of every description—backed by an experience of almost a quarter century.

Pittsburgh Piping & Equipment Co.
PITTSBURGH, PA.

Steel Plate Construction

Steel Storage Tanks, Blast Furnaces, Gas Holders
Steel River Barges and Plate Work of all Kinds
Steel Transmission Towers

RITER-CONLEY COMPANY
General Offices, Pittsburgh, Pa.

Technical Association Papers, Series VIII (1925)

In paper, 248 pages. $3 per copy

CHEMICAL PULP
- Chemistry in the Soda Pulp Process
- Economy of Lime Reburning
- Evaporator Test Code for Soda Mills
- Preliminary Impregnation of Wood
- Strength Test for Chemical Pulp
- Sulphite Waste Liquor as Fuel
- Use of Decayed Wood for Bleached Chemical Pulp

MECHANICAL OPERATION
- Alexander Electric Paper Drier
- Burning of Wood Refuse
- Moisture Meter and Its Use in Water Removal
- Ruths' Steam Accumulator
- Steam Prime Movers for Paper Mills
- Ventilation of Paper Machine Rooms

MECHANICAL PULP
- Norton's Segmental Pulpstone
- Refiners for Groundwood Tailings

PAPER TESTING
- Bureau of Standards and the Weller Brittleness Test
- Extractor and Cleaner for Carbon Paper
- Pulp Weight Factors for Microscopical Analysis
- Relation of Paper Furnish to Paper Tests
- Stains for Microscopical Analysis
- Study of the Mullen Tester
- Test for the Liquid Permeability of Paper
- Tests at Various Relative Humidities
- Use of the Glarimeter for Paper Finish

WASTE
- Burning of Wood Refuse
- Economy of Lime Reburning
- Uses of Carbon Recovered from Black Ash
- White Water and Stream Pollution
- White Water Utilization Code

MISCELLANEOUS
- Baryta Paper
- Bibliography of Paper Making for 1924
- Effect of Acetic Acid on Animal Glue
- Notes on China Clay
- Reference Library
- Standard Method for Testing Rags
- Testing Aniline Dyes
- Twaddle's Rosin Size Color Test

Write to THE PAPER INDUSTRY, 356 Monadnock Bldg., Chicago, Ill.

OHIO NEWS

Mrs. Charles W. Shartle

Sympathy is felt for Charles W. Shartle, head of Shartle Brothers Machine Co., Middletown, in the death of his wife, Lucy Shartle, which occurred November 26th, at Little Rock, Arkansas, where she was visiting her daughter, Mrs. Robert Storm. Death followed a paralytic stroke sustained on the previous Tuesday. Mr. Shartle and son, William, reached Little Rock before death ensued and accompanied the body to Middletown, where funeral services were held.

Mrs. Shartle was widely known in the Miami Valley, many business men of the present day looking back to their student days when she was their teacher and keenly deploring the passing of one whose thoughtful care and scholarly attention made their impress that remained through succeeding years.

Mrs. Shartle was a sister of Adam Bridge, Franklin, O., who with Homer Martindale, a brother-in-law of the decedent, were interested with the Shartles in the paper machine business for many years at Middletown.

Mrs. Shartle is survived by seven children, two brothers and a sister.

Black-Clawson Acquires Shartle Plant

The Black-Clawson Company, Hamilton, announce that they have acquired the plant of the Shartle Brothers Machine Co., Middletown, which will continue to operate under its present name as a branch of the Hamilton concern, which also manufactures paper mill machinery.

Some time ago, it was reported that the Shartle plant had been sold, and rumor connected Chicago capitalists with the deal, involving $1,500,000, but it develops that Chicagoans merely represented the Black-Clawson Company in the transaction.

Charles W. Shartle is also identified with the Middletown Machine Co. and is a director of the First and Merchants' National Bank of Middletown.

Jacob Kindlegerger, president of the Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., visited the Miami Valley, Saturday, November 13th, to take part in the rededication of the Methodist church in West Carrollton, where he first received his religious training as a youth.

Building Activity in Dayton

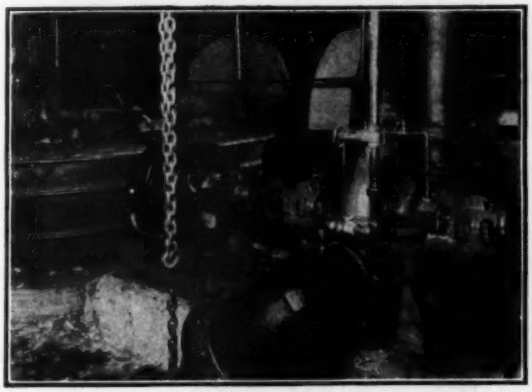
Building progress continues in Dayton and the Miami Valley at a satisfactory rate. The gain in Dayton environs, including Moraine City, where the General Motors Corporation is installing $20,000,000 improvements, has been substantial.

It is difficult to compute the real benefit of this to the paper industry. Roofing material, built-up coverings, felts of asphalt manufacture and other articles of construction, much of which is made from rag stock in the mills of the valley, particularly Franklin and Lockland, have played an important part in the development.

The Miami Valley was represented at the annual meeting of the National Industrial Traffic League, held recently in New York at the Commodore Hotel. Included in the Dayton delegation were Thomas T. Webster, of the Mead paper interests and who is at the head of the national traffic body; Maurice T. Otto, director of traffic department of the Chamber of Commerce; R. H. Hagerman, of the National Cash Register; C. A. Garber and others.

Without increasing the outstanding stock of the company, the Mead Pulp and Paper Co., of Dayton, has issued $300,000 seven per cent cumulative special preferred stock, the 3,000 shares being the property of an estate which is being liquidated in part. The business of the company has been in the hands of the Meads continuously through three generations

Plan Now With "ECONOMY" To Reduce Water Handling Costs in 1927



An Economy Centrifugal Pump Cutting Water Handling Costs in a Paper Mill

Water is one of your biggest material handling problems. With an average 125 tons of water used to every ton of paper made, even slight percentage savings soon more than pay the cost of new over old inefficient equipment.

ECONOMY CENTRIFUGALS have a known record of savings in paper mills that mount as high as 23%. Are you sure that your water cost is down to a minimum basis?

Economy Engineers are responsible for construction and design that enable Economy Centrifugals to be marketed on a basis of reasonable first cost with a length of life that places them ahead of all others when both first and final cost is reckoned with.

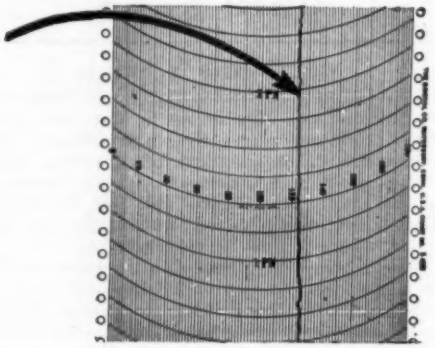
Our Sales Staff, available in offices throughout the country, will co-operate with you to reduce your water handling costs.

Write for Bulletin No. 404 on Centrifugal Pumps and Bulletin No. 403 on Vacuum Pumps

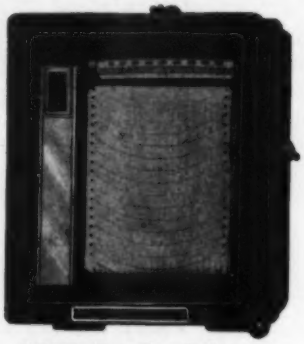
Economy
Pumping Machinery Co.
Centrifugal Pump Specialists
83 North Curtis Street Chicago, Illinois
Branch Offices in Principal Cities

How Fast Does It Go?

THERE are a number of machines in the paper industry the speed of which should be known. Most important, of course, is the paper machine itself. The time was, when the back tender used to have the job of counting the revolutions of the driven pulley of the cone drive, by holding his hand where it would get a bump with each turn of a set screw; this number of revolutions was then multiplied by a factor to get feet per minute on the machine. Frequently, however, it was considered close enough to guess at the speed from the position of the belt on the cone pulleys.



Record made by Bristol's Strip Chart Recording Tachometer installed on Paper Machine.



Bristol's Recording Tachometer Strip Chart Model.

Paper making today is a far more accurate operation than it was then. Now, both the superintendent and the operator depend on Bristol's Indicating and Recording Tachometers to show them the **exact** speed of paper machines.

Our Catalog No. 1700 contains information that may help you improve your product. Ask for a copy.

The Bristol Company *Waterbury, Connecticut*

FOR 36 YEARS — Ask Any Technical Engineer — MAKERS OF

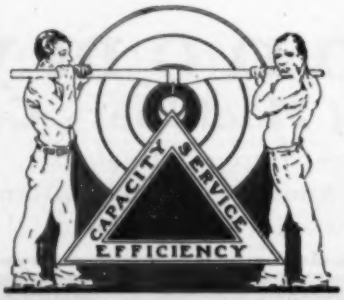
BRISTOL'S RECORDING INSTRUMENTS

DRY PAPER EFFICIENTLY
The Fulton Dryer Drainage System

—Increased production
—Decreased steam pressure on the dryers
—Reduced steam cost for drying

Better Sheet—Better Finish—Less Shrinkage

—and cockling prevented by drying with graduated temperature — Less pressure or vacuum on paper machine dryers.



We will gladly refer you to mills using the Fulton System and making the same grade of paper as you. They will tell you their experience with the Fulton System.

U. S. Patents Dec. 10, 1919, and June 7, 1921. Canadian Patents July 6, 1920, also patents pending.

Fulton Engineering Co.
MIDDLETOWN, OHIO

The Beveridge Supply Co., Ltd., 628 St. Paul St. W., Montreal, Canadian Representatives

since 1846, when the original paper mill was established in Dayton. The company was incorporated in 1905.

A blaze of undetermined origin occurred in the power plant of the Champion Coated Paper Co., Hamilton, Saturday, December 4th. Due to unusually effective work, the flames were confined to the four-story brick structure housing the power plant, which was completely gutted, though the steam boilers were not badly damaged. Complete operation of the plant was made possible by Monday, December 6th.

Cheney Wins Decision

H. L. Cheney, owner of the Cheney Pulp and Paper Company, has won an important decision from the Interstate Commerce Commission after fourteen years of continuous effort. The decision relates to the freight rate on wet rag pulp and makes a material reduction by taking that product out of the fifth class and placing it in the sixth class.

The contention was originally raised by the Srere Bros. in 1912 and Mr. Cheney has kept it alive and held tenaciously to his contention until after fourteen years of controversy his appeal has been granted. The Cheney Pulp and Paper Company is the only concern in the country that ships wet rag pulp by freight, and for this reason they were compelled to fight their battle alone.

Reductions in Prices of G. E. Motors

A reduction in prices on its general purpose motors, amounting to five per cent on most lines and ten per cent on commonly used sizes of squirrel cage induction motors, has been announced by General Electric Co., effective December 1, 1926.

The motors affected by the new price levels include both a-c. and d-c., constant and variable speed general purpose motors, from 1 to 200 horsepower.

Prices of standard squirrel cage induction motors have now been brought by the company to a level within about 10 per cent of that in 1914.

Coincident with this reduction in prices, the General Electric Company has announced a unified schedule of discounts for different classes of purchasers. The discount for quantity purchased at one time, on one firm order, has been made uniform on a sliding schedule for all classes of buyers.

These reductions have been made possible by improved manufacturing processes and quantity production, the company stated in announcing the new prices.

Import Committee Stops False Entries

Three important cases which have been before the Customs Court for trial and repeatedly postponed, have been abandoned by the importers. All involve an effort by importers to enter as standard newsprint duty free, paper which the appraisers considered to be dutiable as printing paper. One of the cases arose at New York, another at Norfolk, and the third at Baltimore. In one case, testimony had been taken both for the government and for the importers. In two cases, the paper was found to carry clay to an extent not desired in paper for newspapers, and one of the cases also involved paper which was considerably sized. In the third case, the paper contained more sulphite than is found in ordinary newsprint. The case which was partly tried was the first to arise after the Import Committee was formed, and the importers' evidence was taken in October, 1924. The Import Committee provided witnesses for the government who testified in January, 1925, and the importers then asked for postponement in order to introduce testimony in rebuttal. Such evidence was never introduced and after seven postponements the court held the case to have been abandoned by default because of the non-appearance of the importers' attorneys at the last hearing.

Another case abandoned by the importers was that of stencil paper imported at Cincinnati which was held by the appraiser to be dutiable at 5 cents per pound and 20 percent, but claimed by importer to be duitable at 3 cents and 15 per cent.

Two cases recently "submitted" which in this instance was equivalent to abandonment by the importers were: Photographic paper imported at New York held by appraiser to be

Watershed Tannate Leather Belting

Something More Than a Confirming Order

"ENCLOSED please find confirmation order to duplicate Tannate Belt furnished us May, 1923, for cone stack drive on our Fourdrinier machine.

"We take this opportunity to express our appreciation for the excellent service obtained with this belt.

"Belts previously used on this drive gave us constant trouble and would not last over three months. Your Tannate Belt has run over three years and during this time has given us no trouble whatsoever. Subsequently, we have equipped quite a number of our hardest drives with your Tannate Belt with most gratifying results.

"Hoping that the Tannate Belt ordered today will fully come up to your standard of quality and service, we are—"

Rhoads Service Guarantee covers every Tannate Belt sold.

Use Rhoads Tanate Lace Leather. It outlasts rawhide three to five times.

J. E. RHOADS & SONS

PHILADELPHIA.....47 North Sixth Street
NEW YORK.....112 Beekman Street
CHICAGO.....334 West Randolph Street
ATLANTA.....80 South Forsyth Street
CLEVELAND.....1234 W. Ninth Street

Factory and Tannery: Wilmington, Del.

Longcrimp
Fourdrinier
Wires

USED EXTENSIVELY ON
Kraft, Wrapping and Newsprint Machines

Give Longer Average Service than the Regular Weave

Made By

The Lindsay Wire Weaving Company
(Collinwood Station) CLEVELAND, OHIO

See page 363 in the 1926 Paper and Pulp Mill Catalogue

BARRE GRANITE IN PRESS ROLLS

Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

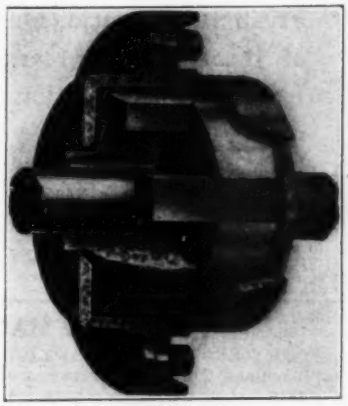
BARRE, VT. **BOSTON, MASS.**

undervalued; filtering paper imported at New York held by appraiser to be undervalued.

A New Flexible Coupling

A new design of flexible coupling is announced by W. H. Nicholson & Company of Wilkes-Barre, Pa., as shown in the accompanying illustration. For many years this concern has manufactured the Nicholson Compression Coupling, which was recognized as one of the pioneer compression couplings on the market.

Owing to the advent of the motor drive, the demand for the compression coupling has been slowly dying out, along with other transmission equipment. The company has been experimenting with a number of flexible coupling designs during the past few years. The outcome of their efforts is the development of the coupling here shown and was invented by Mr. H. S. Nicholson, the manager.



According to the manufacturer's description, the design is very simple as well as powerful and durable. It is a metallic coupling throughout, there being no springs, laminated bolts, grids or discs in its make-up. All forms of shaft misalignment are taken care of by means of the loose, floating keys, with beveled sides. In the smaller sizes three floating keys are used, and in the larger sizes, five. When in motion the centrifugal force throws the floating keys out into the slots, causing them to drive quietly and smoothly.

When the torsional load comes on, the centrifugal force of the floating keys is overcome and they recede to the bottoms of the slots.

A film of oil is maintained at all times between the keys and slots, allowing a free lateral float of the coupling hubs. Any wear that might occur in the sides of the keys after the coupling has been in use, is taken care of by the ever present centrifugal force. In case of an accident or wear to this coupling and new keys are required, they can be made instantly without any delay in any machine shop. Further, the strength of the floating keys of the "Nicholson" is so much in excess of the shaft that the manufacturer states it is not necessary for a customer to mention h.p. or r.p.m. of the job on which the coupling is to be used, as any given size of coupling will withstand a greater load than the shaft itself. The floating keys, as well as the hubs, are made of steel, and the casing of cast steel. A gasket is used between the flanges to insure a tight fit. The coupling is made for all sizes of shafts and all service. It is described in Bulletin No. 1026.

Five Mills Plan Developments

Five surveys on as many important paper mill properties in the United States are reported in progress of development by the V. D. Simons organization, of Chicago, mill engineers and architects.

"Of the five surveys indicated," said Mr. Simons, "three can be mentioned definitely at this time. The other two should develop before the spring months. They have not advanced far enough as yet to make any public announcement. We are now working out a complete plan of development for the Rhinelander Paper Co., Rhinelander, Wis.; for the Miami Paper Co., West Carrollton, Ohio; and the Hawley Pulp & Paper Co., Oregon City, Ore. In each instance, the plan is looking to an increase in production and a general lowering of costs. Each one of the mills indicated now operates four machines."

Direct connected pump and motor of improved design and heavy construction for pumping pulp and thick stock. OPEN IMPELLER TYPE. HORIZONTAL SPLIT CASING. Interior surfaces machine finished. All bearings are removable from shaft without taking off any other part.

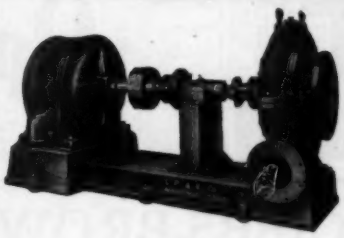


Fig. 67

We build Centrifugal Pumps exclusively—for all requirements

Write for Catalog 5 B

LAWRENCE PUMP & ENGINE CO.

P. O. Box 708 Lawrence, Mass.

DRY-SYS EQUIPMENT — DRYING SYSTEMS, INC. CHICAGO U.S.A.

DRYING SYSTEMS, INC.

SPECIALISTS IN DRYING

1800 Foster Ave., Chicago, Ill.

Sirocco

Hood Systems and Heat Economizers Heating, Ventilating, Air Conditioning and Vapor Absorption Equipment

SPECIFY

Powell Valves

For Long Uninterrupted Service

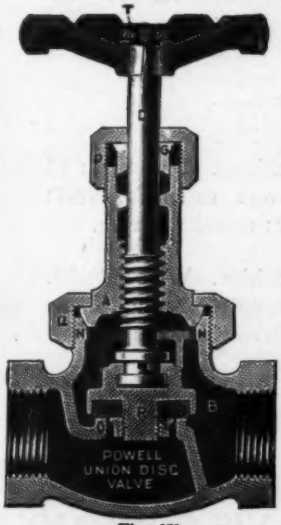


Fig. 150

Powell Composite Disc Valves

are furnished with bronze body and trimmings or iron body with bronze trimmings.

Bronze valves with union outlets are obtainable for both hot water and steam heating installations.

Discs are interchangeable with all standard vulcanized discs. However, we recommend Powell.

Descriptive circular on request.

THE WM. POWELL CO.

Dependable Engineering Appliances

2521-2531 Spring Grove Ave., Cincinnati, Ohio

GIBBS-BROWER CO.

Paper and Pulp Mill Brokers

Used Paper and Pulp Mill Machinery for the Mill

Paper Merchant, Jobber and Converter

USE OUR "GO BETWEEN" SERVICE

261 Broadway **New York City**
166 West Jackson St. **Chicago, Ill.**

Our Motto, "Service First"

Fresh Florida Oranges

Fresh Sweet Florida Oranges $3 per box of three hundred, large size. Sound fruit and satisfaction guaranteed or money back. We pay express charges. A box of these makes an appreciated Christmas gift. Remit with order.

ACME FARMS **Gainesville, Florida**

Sulphite Superintendent wanted for modern mill making bleached pulp. Technically educated man with executive experience preferred. Applicants requested to give in first letter references, education and experience in detail and salary earned and expected. Answer Box 106, The Paper Industry.

PRINTING MACHINES

For Sale: Rice, Barton & Fales two-color, 40", cylinder printing machine. Mather & Pratt four-color, 42" cylinder printing machine. Dismantled and ready for prompt shipment. Room 601, 225 Fourth Ave., New York City.

WANTED: Technical man with experience in production of ground wood pulp, for sales work. Write, giving references and state education, experience and salary expected. Address Box 110, The Paper Industry.

FOR SALE—Pulpwood rossing mill and saw mill combined, best location in Northern Ontario for export business. Located on good river. Storage yards, railway sidings, employees' houses, stables, store houses, camp equipment, etc. Five thousand cords of black spruce can be purchased this season if taken at once for winter delivery. Five townships of virgin timber all available for export; 90% black Spruce, can be driven to this mill. Reasonable terms to right parties. Address Box 111, The Paper Industry.

PAPER MACHINES FOR SALE

In good condition **Immediate Delivery**

One—2-cylinder machine. 2 presses; 10 dryers, 42"x84"; one calender; reel; single drum winder; marshall drive.

One Fourdrinier machine. Wire 96"x50'. 2 presses; 15 dryers, 48"x94"; one calender; reel; two drum winder; marshall drive.

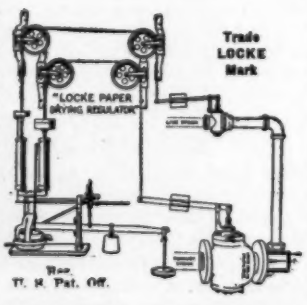
By:

FRANK H. DAVIS COMPANY

175 Richdale Avenue, Cambridge, Mass.

LOCKE Paper Drying Regulator

This regulator controls both live and exhaust steam for any purpose where steam is used, or it will control the direct steam when used alone. In unlike both in construction and operation, any device that has heretofore been designed for this purpose. Controls not only temperature of the dryers when paper is running over them, but maintains the same temperature whenever there is a break in the paper. This machine is most sensitive to any change in temperature of dryers, yet it has been found to be perfectly reliable and what is more, is not continually getting out of order. Also manufacturers of other steam specialties.



Locke Regulator Co., 76 North St., Salem, Mass.

"Locke" Regulator Agency, 39 Cortlandt Street, N. Y. C.

This Opportunity Section Brings Quick Results to Advertisers.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of the Paper Industry, published monthly at 356 Monadnock Bldg., Chicago, Illinois, for October 1, 1926.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared E. B. Fritz, who, having been duly sworn according to law, deposes and says that he is the publisher of the Paper Industry, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, E. B. Fritz, 356 Monadnock Bldg., Chicago, Illinois; Editor, A. Scott Dowd, 356 Monadnock Bldg., Chicago, Illinois; Managing Editor, A. Scott Dowd, 356 Monadnock Bldg., Chicago, Illinois; Business Manager, E. B. Fritz, 356 Monadnock Bldg., Chicago, Illinois.

2. That the owner is (If the publication is owned by an individual his name and address, or if owned by more than one individual the name and address of each, should be given below; if the publication is owned by a corporation the name of the corporation and the names and addresses of the stockholders owning or holding one per cent or more of the total amount of stock should be given.): **E. B. Fritz, 356 Monadnock Bldg., Chicago, Illinois.**

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) **None.**

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

EDWARD B. FRITZ,
(Signature of editor, publisher, business manager, or owner.)

Sworn to and subscribed before me this 21st day of September, 1926.

(Seal) S. J. LEHRER, Notary Public.
(My commission expires June 30, 1928.)

Joseph T. Ryerson & Son, Inc., have purchased the warehouse division and property of the Bourne-Fuller Co., at Cleveland. The property consists of a group of large modern warehouses, with 200,000 square feet of ground area. The plant is stocked with a complete line of bars, shapes, plates, sheets, and steel products, totaling about 12,000 tons in all.

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Metallic coupling throughout—no springs, laminated bolts, grids or discs. All forms of shaft misalignment taken care of by means of loose fitting, floating keys with beveled sides. Made for all sizes of shafts.

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During August, 1923, The Beveridge Paper Company, Indianapolis, had one Holland type engine rebuilt into a Dayton High Speed Engine. Later on they ordered a new Dayton. After that they had us change over two more Hollands. Still later, April, 1925, the Beveridge people had another Holland engine reconstructed. **Salesmanship may have sold the first one—but nothing other than satisfaction sold the repeats.**

Heavier Furnishes
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If you have Holland type beaters on the job, give us an opportunity to figure with you.

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SPEED UP
by
THICKENING BEFORE BLEACHING
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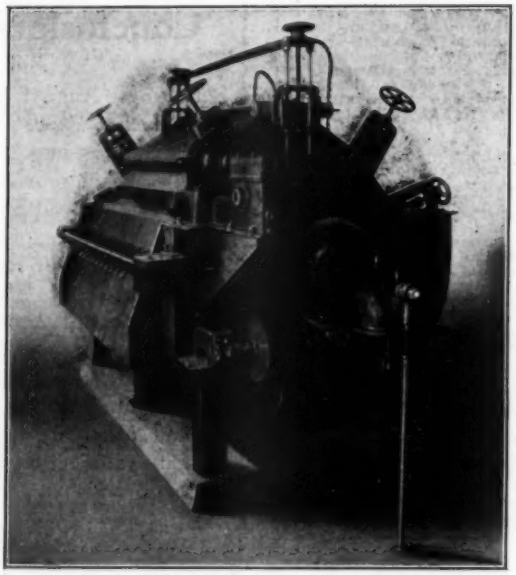

This OLIVER is handling 2,000,000 gallons per day containing 0.3% solids.

Effluent shows no fibre loss.

Discharges sheet three-quarters inch thick.

Density, 22½% air dry.

Capacity forty-eight tons per day.

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See page 381 in the 1926 Paper and Pulp Mill Catalogue

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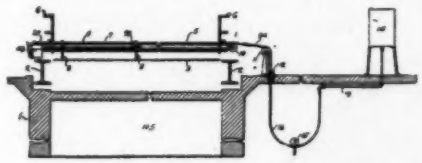
Technical Developments in the Paper Industry

Domestic and Foreign

The following abstracts are of the latest developments found in the foreign press and the domestic and foreign patent offices. Photostats and translations of complete articles and patents can be obtained at cost price.

Fourdrinier Wire and Felt Cleaner

THE illustration shows a wire cleaning device which is patented in United States Patent, No. 1,606,172. This device comprises a transverse supporting piece which carries a noz-



zle carrier, the latter being slid along the support by means of a suitable contrivance. The movement of this nozzle carrier over the support is automatically effected by hydraulic means so that all parts of the felt and the wire are properly washed with the water.

Sizing Paper with Rosin

AS THE free rosin content of the size increases, the fineness of the particles of rosin increases. With a fifty per cent content, mixing arrangements must be used and with a sixty per cent content they fail to work. Dilution of the rosin milk with water, results in the hydrolysis of the sodium salt and almost all the rosin is then present in the free form. Such rosin should be taken up by the fibers. The presence of too much combined rosin is due to the formation of aluminum resinate in the beater. Thickly viscous rosin soaps show a tendency to form lumps when emulsified with water. It is therefore advisable to maintain the mixture in as thinly viscous a stage as possible by heating during emulsification. It is also important to control the quality of soda used by determining accurately its water content.

Alum solutions are soluble in the soap for they are hydrolyzed. The greater the dilution of the solution, the greater the degree of hydrolysis. At a definite degree of dilution, the solutions contain a certain definite concentration of hydrogen ions. It was substantiated that when sodium resinate is employed, equivalent amounts of aluminate resinate are formed. ($Al(C_{20}H_{29}O_2)_3$). It was not found that an excess of alum would result in the formation of free rosin due to the decomposition of the aluminum resinate formed in the mass. On the other hand this condition can be attained by the use of sulphuric acid. The action of aluminum sulphate on sulphite pulp has been explained as consisting of the absorption of aluminum by the fiber and the simultaneous passage of lime into the water. The author believes that the lime is combined with organic matter in the fiber and that a very small portion of this calcium salt is split off with the aluminum ions of the aluminum sulphate, resulting in a very small amount of calcium ions being present in the water. The general assumption that colloidal aluminum hydrate is absorbed by the fiber, that is principally by its structure, is questioned by the author. The dissolving out of the lime from the fiber by means of weak mineral acids is entirely incomplete.

On the other hand, it appears that sulphur dioxide will dissolve lime and this solvent action will be greater, the longer the dissolving action lasts. The conversion of the various proportions of calcium and aluminum which are interchanged with alum in the fiber takes place in the case of strong sulphite pulp in the proportion of 1.65 to 1.00, and in easy bleaching pulp in the inverse ratio of 0.8 to 1.00. The author thus explains that the lime is dissolved out towards the end of the digestion process, whereat the free organic acids, to which the lime was joined, remains behind and absorbs the aluminum.

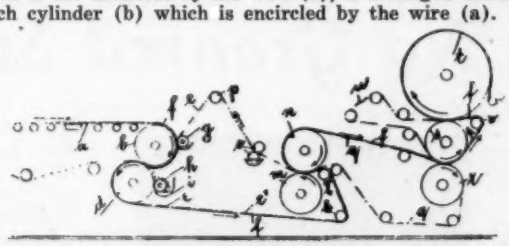
The author doubts the absorption of the aluminum as hydrate or basic hydrate for then an equivalent amount of SO_4 must be found in the water, which is however not the case. The formation of lime resinate, which is quite soluble in water, is dependent on the simultaneous presence of lime and aluminum in the water and the addition of rosin size only to the extent of approximately ten per cent as such and ninety per cent of aluminum resinate.

Sulphite cellulose acts as an acid on milk of rosin and consumes a certain proportion of hydroxyl ions, whereby free rosin is precipitated. Each bleaching sulphite pulp liberates twice as much free rosin as bleached sulphite and strong sulphite liberates about twice as much free rosin as the easy-bleaching pulp.

For further details on this interesting subject, see the comprehensive articles published in Svensk Papp.—Tidn., 1925, numbers 20, 21, 22 and 23.

Fourdrinier Machine for Thin and Thick Papers

THE Fourdrinier paper-making machine, that is shown in the accompanying illustration and that is patented in German Patent, No. 431,408, is characterized in the fact that the usual upper couch cylinder (d), which has no covering and which is not encircled by the wire (a), is arranged under the couch cylinder (b) which is encircled by the wire (a). The



wet felt (e) passes between the two couch rolls (b) and (d) and works in conjunction with a second wet felt (q) which passes between the press rollers (m) and (n). The wet felt (e) lifts the paper web (f) from the wire (a) and leads it through the first press rollers (m) and (n), the paper web entering underneath and then carries it over to the second felt (q). The latter yields the paper web up to the cloth (u) which travels between the second set of press rollers (r) and (s), and finally the paper web is taken up by the drying cylinder (t) of the machine.

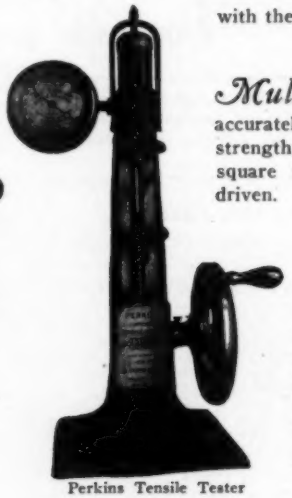
Making Coated Paper

PAPER sheets or boards are finished by filming the surfaces with rubber associated with sizing and surfacing materials. The rubber may be in the form of latex or in an emulsified condition, and a small amount of ammonia may be added to maintain the rubber in a mobile condition. The surfacing materials may comprise kaolin, blance fixe, satin white, barytes talc, precipitated chalk, zinc oxide and the like. The sizing material may consist of casein in an alkali solvent, glue, starch, gums or resins.

When using rubber latex the treating liquid is prepared by mixing the latex with pigments, sizes and surfacing materials and it is applied to the paper, after manufacture, by a machine comprising a trough and rubber rolls or brushes.

You can keep *Your Product* up to *Your Standard*

Mullen Paper Tester



Perkins Tensile Tester

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The Mullen Paper Tester

accurately measures the bursting strength of paper in pounds per square inch. Hand or motor driven.

The Perkins Tensile Tester

accurately measures the tensile strength of paper in pounds per inch strip. Can be furnished with or without the Elongation Measuring Attachment.

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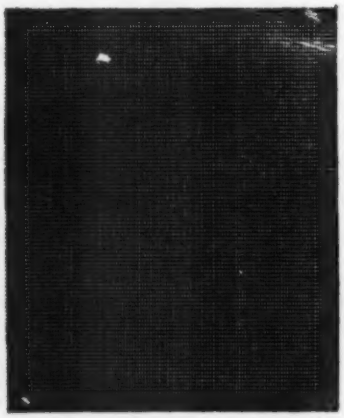

CABBLE Superior Fourdrinier Wires are perfectly smooth and even in mesh and will not cut grooves in the suction boxes.

Their toughness and strength enable them to stand up under extremely severe duty. Long and efficient service are synonymous with Superior Fourdrinier Wires.

Farsighted mill owners and Superintendents have learned to place explicit confidence in Cabble Superior Fourdrinier Wires, as evidenced by their use in hundreds of paper mills throughout the United States.

The paper industry has realized that our over three-quarters of a century in manufacturing wire products amply qualify us to meet their requirements.

We also make cylinder faces of standard mesh in phosphor bronze or brass of the highest quality.

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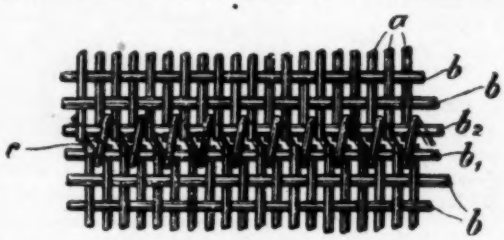
The sheets, etc., thus treated, are immediately exposed to the air to dry and set and are finally calendered. After treatment the sheets, boards and the like may be submitted to cold vulcanization by exposure in a sulphur atmosphere. When operating with coagulated raw rubber, a putty-like product is first obtained by causing the rubber to absorb a large quantity of water, this product being emulsified with kaolin or like colloidal clat and the size and other materials are finally introduced. British Patent, No. 253,066.

Tying Ups Ends of Metallic Cloths for Paper and Pulp Manufacture

IN ORDER to give the metallic cloth that is specially used for the manufacture of pulp and paper the form of an endless web, it has been common practice to tie together the ends of the cloth with the aid of a piece of wire, and then soldering these ends, or just soldering them without using the wire. The ordinary soft solder is not suited for this purpose. This is also true of the welding process, which may be carried out



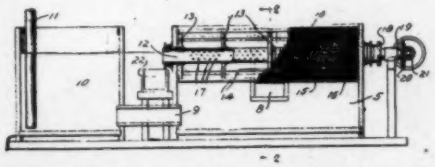
either in the electrical or mechanical manner. The reasons for this have been first that this practice requires the use of specially alloyed wire and secondly that that cross-sectional area of the wires are decreased to a considerable degree by the welding operation.

The new process which is patented in German Patent, No. 433,516, does away with these difficulties. As may be seen from the accompanying illustration, which shows the points of juncture between an endless wire fabric prepared according to the new process in a top view, the wire is seen to be composed of vertical wires (a) and horizontal wires (b). In order to tie together the last filling wire (b^1) or (b^2) of one of the ends of the cloth in a manner which is free from all objections and which does not incur the weakening of the wire structure as brought about by welding, with ends of the wires in the warp (b), the two last named filling or weft wires (b^1) and (b^2) are soldered with the aid of a hard solder with the corresponding warp wires (a). In this manner a satisfactory and permanent connection is made between them, with the result that these joined filling wires (b^1) and (b^2) can be directly joined together with the aid of a piece of wire (c). This wire (c) is thereby joined to no part of the wire cloth over a mesh opening and the result is that the connection is very smooth and there is no impression made on the paper of the joint in the wire.

Pulp Saving Device for Paper Mills

THE illustration shows a pulp saving device for use in paper mills, which is patented in United States Patent, No. 1,604,250.

This device consists of a tank which is shown at (5) and in which there is a rotatable cylinder screen (16). This screen



is located in the upper portion of the tank. There is an outlet through this screen which is for the purpose of determining a normal water level in the tank. There is also an inlet below the normal water level which is employed for the purpose of feeding white water into the tank. There is also an opening at (9) which is connected with a cistern (10) so that a steady flow of pulp takes place from the tank to the cistern. Means are also at hand for withdrawing the pulp from the cistern during the operation of the machine to cause the level of the pulp in the cistern to be below the normal water level in the tank.

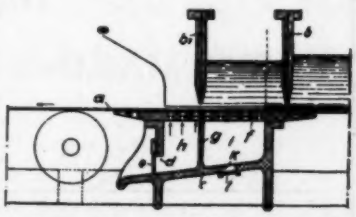
Digestion of Spruce Wood with Dilute Nitric Acid

THE oxidation of the lignin with ten per cent nitric acid sets in with a vigorous evolution of gas at a temperature of approximately 75 to 80 degrees C. and continues for about fifteen hours in an open vessel at 95 degrees C. As the lignin products do not go into solution, the penetration of the acid is slow and well digested cellulose is obtained only when uniformly and very finely ground material is used. The penetration is greatly assisted by first boiling with aqueous potassium nitrate and adding later the equivalent quantity of sulphuric acid.

The yield and quality of the cellulose, after subsequent boiling out with alkali, are approximately comparable with those obtained by the sulphite process of digestion. The necessary proportion of nitric acid is thirty-five to forty per cent of the weight of the air dry wood, but the actual consumption of nitric acid is approximately thirty per cent. The reduction products of the nitric acid comprise nitric oxide, ammonia and nitrogen. An appreciable quantity of hydrocyanic acid is also formed, sufficient to make the process dangerous on a large scale. Nitric oxide and ammonia account for fifteen per cent of the total nitrogen consumed, but they are produced in too dilute a condition for practical utilization. The reaction may be expressed as an oxidation of the side chain of the coniferyl complex of the lignin and the nitration of the aromatic nucleus. The latter process comes to an equilibrium with the production of hydrocyanic acid and nitriles. Cellulosechemie, 1926, volume 7, pages 113-118.

Making Paper on the Fourdrinier Machine

ACCORDING to German Patent, No. 428,843, a water box, provided with a regulatable outflow opening, is arranged near the foam doctor under the wire for the purpose of obtaining a counter-water pressure, but this device entails certain disadvantages. Thus, if the regulated outflow opening is opened too wide, then a back pressure results in the portion between the two foam doctors which prevents the choking effect in the portion of wire behind the last foam doctor. Furthermore, there are a number of paper stocks which require strong dehydration and which cannot therefore be worked with when this arrangement is employed.

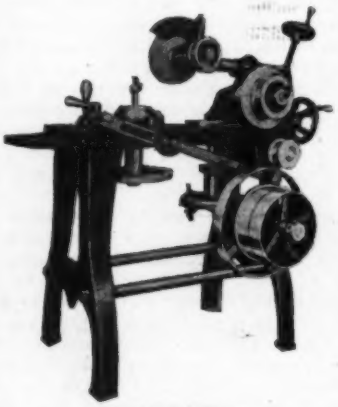


The new device which seeks to counteract these difficulties depends on the fact that, when the paper fibers are kept moving over a short portion of the wire near the last foam doctor, it is sufficient to have a back pressure only in that location.

Thus in the figure, the longitudinal wire is shown at (a) and the two foam doctors are located at (b) and (b^1). The wire (a) runs over a board (f) which is provided with holes and the water box (c) is arranged under this board. This box is divided into two compartments (h) and (i) by the cross-piece (q). The compartment (h) is provided with an opening (d) which is regulated by means of the slide (e) and the compartment (i) likewise has an opening (k) which is regulated by means of the slide (l). A certain degree of dehydration of the paper web can be accomplished within the compartment (i), and in spite of this it is also possible to engender a damming action in the compartment (h) by the introduction of water under pressure, this action being indicated in the figure in the direction of the arrows.

The setting of the slide (e) acts only on the extent of this choking or damming action in the space (h), and hence it has no effect on the pressure relations that exist in the space (i). It is advisable to connect the chamber (i) with the chamber (h) by a passage which is controlled by means of a valve. When this arrangement is employed to work up a paper stock which does not require a strong dehydration, then the valve controlling the connection between the two chambers is opened

Most Every Paper Mill Has Koegel Equipment



THE STANDARD
Capacity—8½-inch Diam. Slitters

Specifications: Floor space, 27"x 42"; speed of spindle, 55 revolutions; driving pulley, 9"x2½"—speed, 400 revolutions; emery wheel, 7"x½"—speed, 3,000 revolutions; weight, about 425 lbs.

Over 800

Standard Koegel Patent Universal Slitter and Circular Knife Grinders are in the paper and pulp mills of the United States and Canada. What greater evidence could be offered for the universal service this grinder renders?

For Greater Capacity

The Koegel No. 4 Patent Universal Slitter and Circular Knife Grinder is built for Slitters up to 16" in diameter. In mills where larger diameter knives and slitters are used, 150 are in service.

Here are the specifications: Floor space, 32"x52"; speed of spindle, 55 revolutions; driving pulley, 10"x2½"—speed, 400 revolutions; emery wheel, 8"x½"—speed, 3,000 revolutions; weight, about 525 lbs.

THE KOEGEL No. 4
Capacity—16-inch Diam. Slitters

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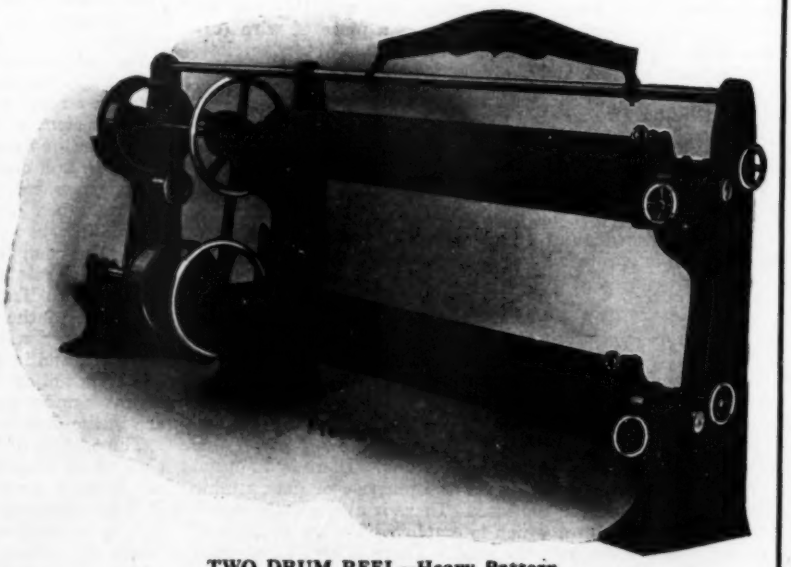


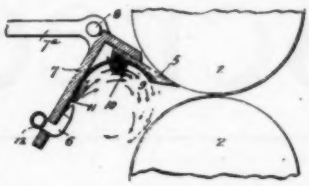
TWO DRUM REEL—Heavy Pattern

and the water which passes through the pulp into the chamber (i) is utilized in securing the damming effect in the chamber (h). On the other hand, when paper stocks are being made into paper, which stocks require considerable dehydration, then the connection between the two chambers must be kept closed and the pressure in each compartment is regulated separately. German Patent, No. 431,407.

Improvement in Paper Making Machine

THE illustration shows an improvement which has been made in a paper-making machine and which is patented in United States Patent, No. 1,605,067.

The improvement consists of a rotary roll and a traveling member which is in position to receive the paper web from the roll. The doctor knife is seen at (7) and cooperates with the roll and aids in lifting a lead strip of the paper web from it. There is also a fluid deflecting extension which is associated with the doctor. The nozzle is seen at (6) and the path of the fluid which is ejected from that nozzle is indicated by arrows in the figure. Means are also provided for directing the fluid blast against the extension which is shown at (7) and which is so shaped that it deflects the blast away from the roll and towards the traveling member.



Determining Chemical Pulp and Wood in Paper

VARIOUS methods, that are well known and widely used for this purpose, were first described, and then a method which is not so well known and which has been used by the author for a long time to determine the proportion of chemical pulp and mechanical wood pulp in paper.

This method consists in taking one gram of air-dried newsprint and bringing it into a 250 cubic centimer flask, with a wide neck and a glass stopper. Fifty cubic centimeters of concentrated hydrochloric acid are added (38 per cent) and then after the acid has been thoroughly mixed with the paper, five cubic centimeters of concentrated sulphuric acid are added. During the first hour, the flask is shaken several times very vigorously and is then allowed to stand until the next day. The contents of the flask are then diluted with water and poured out into a 750 cubic centimeter beaker and brought up exactly to a volume of five hundred cubic centimeters.

After being heated to the boiling temperature for several minutes, the lignin is allowed to separate out and the supernatant clear liquor is allowed to flow off and the deposited substance is filtered through an aluminum crucible. The mass is well washed with water and the crucible is dried at a temperature of 100 degrees C. until it attains constant weight. This can be considered as a measure of the percentage of mechanical wood in the paper, when the latter is free from ash. When various fillers are added to the pulp, an ashing test must be made. On the basis that one hundred parts of filler are equivalent to 88 parts of ash it is possible to obtain the content of "pure" lignin. The following tabulation gives some interesting data on various paper analyses:

Percentage of mechanical wood	00	30	40	50	60
Percentage of sulphite pulp....	100	70	60	50	40
Grams of lignin.....	0.030	0.101	0.125	0.145	0.166
Percentage of mechanical wood	00	30	40	50	60
Percentage of sulphite pulp...	30	20	10	00	
Grams of lignin.....	0.188	0.215	0.240	0.266	

For quick determinations it is possible to use graphical figures. The percentage of mechanical wood pulp in the paper can also be calculated from the following formula: Percentage wood $= \frac{100 \times (L-C)}{T-C}$. In this formula L is the grams of pure lignin in one gram of the air-dried sample of paper; T is the grams of pure lignin in one gram of air-dried mechanical wood, which is equal to 0.266; and C is the grams of pure lignin in one gram of air-dried sulphite cellulose, which is equal to 0.030.

The sources of errors in this method are the varying content of lignin in sulphite pulp and mechanical wood pulp. The values which are given above are good average values of the lignin content. There is also the varying moisture content of the samples in the air-dried condition. Then again the average ash content of the chemical pulp and the mechanical wood pulp, equal to five per cent, is neglected. In spite of these errors this method appears to be usable for practical purposes and yields results which are comparable with those that are obtained by other methods. Papir Journalen, volume 10, page 121 ff (1926).

Guignet Cellulose from Wood Cellulose and Wood

A NUMBER of investigations have been made by Dr. Schwalbe on the preparation of Guignet cellulose from wood cellulose and wood, as reported in Zeitschrift fuer angewandte Chemie, 1926, volume 39, pages 606-8.

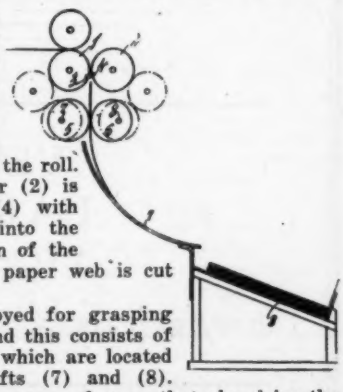
Cellulose dissolves completely in 62 per cent sulphuric acid to a colloidal solution, from which it may be reprecipitated by the addition of electrolytes, or by dilution with water, alcohol or ether. The Guignet cellulose prepared by dissolving one gram of sulphite cellulose in seven cubic centimeters of 62.53 per cent sulphuric acid and precipitating after five hours by the addition of water, is completely redissolved by water to a milky solution, and is dissolved to the extent of 95 per cent by 10 to 17.5 per cent sodium hydroxide solution. The yield is 95 per cent.

The cellulose, copper and hydrolysis numbers are 0.4, 8.2 and 14.7, compared with 0.2, 2.4 and 5.9 respectively, for the original sulphite cellulose. (The cellulose number is a measure of the degree of "swelling"; it is determined by immersing the sample in Fehling's solution and, after thorough washing, ascertaining the quantity of copper fixed.) By twice dissolving in ten per cent sodium hydroxide and precipitating with acid a yield of thirty per cent of a substance having a copper number of only 2.6 is obtained. The pentosan content of the Guignet cellulose is 0.56 per cent, compared with 5.2 per cent for the sulphite cellulose, indicating that pentosan is more readily hydrolyzed by sulphuric acid than is cellulose. By this process, the cellulose is readily dissolved from spruce wood, leaving twenty-nine to thirty per cent of lignin. The Guignet cellulose obtained contains only 1.4 per cent of pentosan.

Sheet Cutting Device

IN ORDER to divide up a wet paper web into single sheets, the apparatus which is shown in the accompanying illustration and which is patented in German Patent, No. 431,290, is employed.

The apparatus consists of two rollers (1) and (2) which run in opposite directions. The wet paper web is grasped between these two rollers and advanced. At the same time a perforation of the web is accomplished by means of the same two rollers, for the roller (1) is provided with a slot parallel to its axis and extending over the entire length of the roll. On the other hand, roller (2) is provided with a knife (4) with teeth which penetrates into the slot (3) on each rotation of the roller. In this way the paper web is cut into sheets.



A new device is employed for grasping the cut sheet of board and this consists of two rollers (5) and (6) which are located eccentrically on the shafts (7) and (8). The rollers are driven by means of gears that also drive the perforating rollers. The rollers (5) and (6) are arranged in such positions on their shafts that they touch each other quite closely when the cellulose sheet has been cut above. Thus these rollers grasp the cut sheet at this moment and tear it from the remaining web. These rollers rotate one revolution for each perforation of the sheet and hence make the same number of turns as the knife roller.

The speed of rotation is chosen in such a manner that this is greater than that of the roller (1) and (2) and hence the grasped part of the sheet must be torn off from the remainder. The greater speed of rotation is attained through the fact that

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Pulp Screen

WHAT DOES YOUR **POWER** COST YOU

UNHEARD OF LOW **POWER** PER TON

HALF **POWER** SAVED

VERY LARGE CAPACITY

VERY LIMITED FLOOR SPACE

OFFERED ONLY AFTER MANY MONTHS OF CAREFUL DEVELOPMENT

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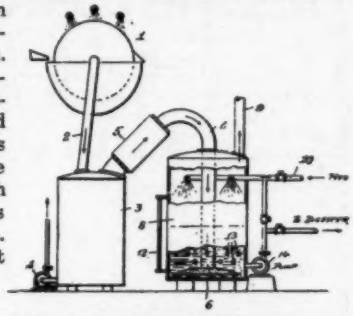
Nashua, N. H., U. S. A.

in spite of the small angular speed of all the rollers, the distance between the contact surfaces of the roller (5) and (6) from their rotating axes is greater at the moment of tearing than the radius of the rollers (1) and (2). After the sheet has been torn off, it is allowed to slide down the guide surface (7) and then it falls on a board (8) on which it is collected and removed from time to time. German Patent, No. 431,290.

Filtering Wood Pulp

WOOD pulp which is manufactured in accordance to the alkali method and which contains an alkali foam is filtered in an installation which is shown in the accompanying illustration. The filtering process consists essentially in breaking down the foam and catching the alkali in this foam by passing the foam-laden air through a liquid bath on its way to the pump. United States Patent No. 1,603,507.



Recovery of Fibers from Waste Waters

AFTER the various devices that are employed for the recovery of fiber values from waste liquors have been described in the article, published in Bumaschnaja Promischlennost, 1926, number 4, tests are described which were instituted for the purpose of improving the methods of operating these devices and for determining the speed at which the fibers settle to the bottom of the recovery apparatus. The figures given in this article are calculated for settling funnels, tanks and filtering cloth.

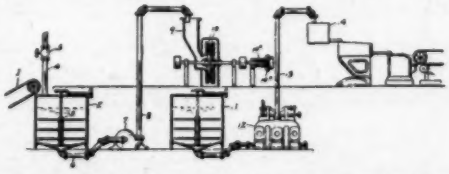
The laboratory experiments which were carried out on a practical scale yielded the information that for the recovery of seventy-five per cent of the fibers present in the waste liquors, a speed of half a millimeter per second must not be exceeded in the upper portion of the settling funnel. If a recovery of sixty-five per cent is satisfactory, then the speed of settling can be increased with safety to 0.8 or one millimeter per second. The finer fibers settles with more difficulty, at a speed of 0.1 to 0.2 millimeter.

It is interesting to note that the alumina and the fibers in the waste liquors settle at about the same rate of speed, and this is corroborated by the identical ash content of various samples of the settled mass. The use of various screens for filtering is also discussed and the results of practical experiments are given.

Paper Making Process

UNITED STATES Patent, No. 1,603,534 is concerned with a paper making process carried out in apparatus shown in the accompanying illustration.

The process consists in the suspension of the paper stock



in water and then delivering it in a continuous flow while suspended and saturated to an attrition machine. This machine has metal discs which rotate in opposite directions at a very high speed. Then the treated paper stock is delivered into a web or other forming machine. The operation is continuous.

Colloidal Character of Rosin Sizing

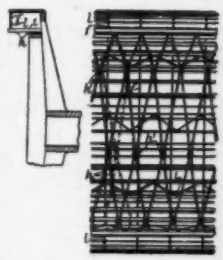
THE free rosin portion of the rosin milk is in the colloidal condition, while the combined portion is present as a sodium salt in the molecularly dispersed status. Furthermore, a larger portion of this is dissociated. The free rosin particles in a good grade of milk of rosin are present in a magnitude of approximately one-tenth of a mu. These particles are visible under the microscope and show the Brownian movement. In poor grades of rosin milk the size of the particles of free rosin rise to as great as three mu.

The maintaining of these particles in the finest possible size is assisted by the reduction of the viscosity of the rosin soap by atomization. Strong dilution of the rosin size with water results in further dissociation of the combined portion of the rosin. This results in the formation of free rosin in the colloidal condition and of very slight degree of dispersion. The presence of acids or large quantities of salt results in the agglomeration of the particles until flocculation takes place, which occurs when the size of the particles attain one mu.

The sizing capacity of a substance, when all other conditions are maintained constant, varies in accordance with the magnitude of the particles of rosin. The smaller these particles are, the greater the area of surface which they can cover. Sulphite pulp, which has been treated previously with alum and then freed from all excess of this salt, can absorb colloidal rosin. The aluminum of the alum gives a positive charge to the fibers. Iron, chromium, zinc and copper do likewise, but in varying degrees. Fiber which is free from ash will not absorb aluminum from a solution of aluminum sulphate (paper-maker's alum). The formation of aluminum hydroxide under the various conditions that prevail during the sizing of pulp is doubted. Svensk Papp. Tidn., volume 4, page 82 (1926).

Dandy Roll

THE tendency to sag and bend of dandy rolls of great length and large diameter used in fast running paper making machines is overcome by the provision of an interior concentric wire work cylinder comprising a spiral (h) and longitudinal wires (i), the two cylinders being separated by distance pieces or rings (f) formed with holes (1) to lighten them. The whole is soldered together. The wires (i) are made of strip or bar metal of greater width than thickness with the width extending radially of the roll, and may be of zig-zag or sinuous form. The spiral (h) also is of sinuous or zig-zag form, the consecutive turns being connected together as at (h^1), shown in the accompanying illustration. British Patent, No. 256,035.



Violet Fluorescence of Sulphite Wood Pulp and Waste Liquors

SULPHITE wood liquors and unbleached sulphite wood pulp show a strong lilac fluorescence in ultra violet light, which changes to a bright green by the action of alkali and is gradually destroyed during the bleaching process. The substance which possesses this property has been located in the free state in the living secondary bark layers of fresh spruce wood, and it also exists in the latent and firmly combined form in the wood itself.

The fluorescence was observed in the light that was given by a Hanau analysis quartz lamp and showed up very strongly when the outer bark was lifted with a knife. Aqueous extracts of spruce bark, which are used for tanning for example, are exceptionally rich in this fluorescent substance and show the phenomenon even when highly diluted. From acid or neutral solutions the fluorescent substance is irreversibly absorbed by cellulose fibers, both in spruce bark extracts and in sulphite waste liquors, although in the latter the fixation properties on cellulose are considerably weakened.

Although the free, water-soluble fluorescent substance is derived only from the secondary bark layers, wood which has been carefully separated from these layers and shows none of the characteristic lilac fluorescence, develops this substance when digested with calcium bisulphite at a temperature of 115 degrees C. The digestion liquor acquires the same properties as ordinary sulphite waste liquor and the fiber residue is firmly "dyed" with the violet fluorescence. It is also proven that the fluorescence of unbleached sulphite pulp is due not to a lignosulphonic acid but to a natural constituent of the wood. Papier Fabrikant, 1926, volume 24, pages 497-499.

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Examinations
Reports
Estimates of Cost
Designs
Specifications
Valuations

New York, December 1, 1926.

REPORTS with few exceptions continue to tell of satisfactory activity in the paper market. There is a consistently good movement of most classes of paper, demand has its limitations as many consumers, in fact, it can be said a great majority of consumers, are buying only to cover direct requirements, but the aggregate business transpiring is of fairly broad proportions. Manufacturers and jobbers have been kept quite busy during the last month; it is stated that most mills are operating at close to full capacity, and distributors of paper are receiving a sufficient number and volume of orders to keep them well engaged. It is agreed generally in the trade that the past three months—September, October and November—constitute one of the liveliest periods the industry has witnessed in a long time, and there seems every reason to believe the market will continue active over the turn of the year and well into the new year, although there may be some quieting of demand around the holidays, as ordinarily is the case.

The condition of the market at present is very healthy. On all sides information is obtained to the effect stocks of paper of nearly every kind and in practically every quarter are unusually low. Jobbers are not beginning to carry what used to be considered normal stocks of paper, nor are consumers possessed of any considerable supplies other than that actually needed to tide them over very brief periods. Reports say also that mills are not stocked to the extent that they have been in previous years. In other words, the policy in vogue regarding stocks is just the same in the paper industry as in other important commodity markets—everyone, whether on the producing or consuming end, is endeavoring to keep stocks as small as their definite necessities will permit while pursuing a more or less hand-to-mouth purchasing arrangement. This means that demand should keep up to at least a certain level right along because buyers will not be able to refrain from placing orders for any appreciable length of time, unless their needs should suddenly shrink which appears most improbable at the moment. Furthermore, the hand-to-mouth policy of buying should aid in holding prices steady as it is an axiom in business that this character of purchasing constitutes a very strong factor in maintaining market values.

Production of paper by United States mills showed a little increase in September as compared with the preceding month, according to the monthly statistical summary of the industry compiled and issued by the American Paper and Pulp Association and affiliated organizations. During September paper production reached a total of 571,988 tons, contrasted with 569,577 tons in August, representing a gain of 0.8 per cent for the identical mills reporting, following an increase of 5 per cent in August over the July output. September production also compared with 540,660 tons in July, 572,968 tons in June, 555,696 tons in May, 573,528 tons in April, 599,719 tons in March, 523,657 tons in February, and 548,820 tons in January. Production of paper in September was below the tonnage shipped out by mills in that month because despite the slight increase in output during the month over August mill stocks were smaller at the end of September than a month previous, total stocks amounting to 249,167 tons of all grades on September 30, against 251,479 tons at the end of August. Shipments during September from mills aggregated 571,273 tons, contrasted with 562,193 tons shipped in August.

The production of newsprint in the United States and Canada reached a new high level probably for all time in the past during October, 1926, according to the monthly report of the News Print Service Bureau. In October mills in the United States manufactured 143,148 tons of newsprint and shipped 146,411 tons, while Canadian mills produced 168,860 tons and shipped 168,821 tons, making a total United States and Canadian production of 312,008 tons and shipments of 315,232 tons. The newsprint mills also made 1,186 tons of hanging paper in October, 369 tons of which were made in Canada. During October 17,512 tons of newsprint were made in Newfoundland and 1,040 tons in Mexico, so that the total North American production for the month amounted to 330,560 tons. For the first ten months of 1926, the Newfoundland output of newsprint totaled 151,102 tons, an increase of 126 per cent over 1925, and the Mexican output was 10,612 tons or the same as in the preceding year. In October the U. S. mills operated at 96.8 per cent of rated capacity and the Canadian mills at 98.1 per cent. The U. S. mills made 11 per cent more newsprint in the first ten months than in the same time last year, while the Canadian mills produced 24 per cent more, the combined production of the two countries being 17 per cent larger in the first ten months of the current year than in the similar period a year ago. Total output in the ten-month period of both U. S. and Canadian mills was 2,952,755 tons, contrasted with 2,516,000 tons in the corresponding time of 1925. The figures show that within the comparatively short space of time of five years, newsprint production on this continent has very nearly doubled.

A slight gain in production of paper board in the United States was recorded in September as compared with August. Mills of the country made a total of 225,937 tons of board in September, against 222,245 tons in the preceding month, operating at 108.8 per cent of rated capacity on a five-day working week, as contrasted with 106.9 per cent in August. Board production in the first nine months of this year totaled 1,887,884 tons, showing a sharp increase over the 1,687,922 tons produced in the same period a year ago. Orders received by mills for board in September called for a total of 215,102 tons, against 207,230 tons in August, while unfilled orders held by manufacturers at the end of September were for 100,765 tons, contrasted with 109,245 tons a month previous. Shipments of board from mills in September aggregated 223,581 tons, compared with 220,534 tons in August, and stocks of board at mills at the end of September totaled 59,915 tons, against 57,559 tons at the end of the preceding month. Board mills consumed a total of 206,593 tons of waste paper during September, compared with 216,017 tons in August, and had stocks amounting to 116,329 tons on hand at the end of September, contrasted with 192,635 tons a month previous.

The market for newsprint is very firm. Consumption is hitting the high spots, as anyone can readily see by a glance at the newspapers in any large city. Publishers in New York City are using up print paper at a fast clip, probably in greater volume than ever before recorded, and the same holds true throughout the country. Contracts for 1927 deliveries are being made at the same price basis as has prevailed all during this year, and it is reported most consumers are ordering increased tonnage.

Kraft paper is moving actively and in good volume. Prices are well maintained with the tendency upward. Book papers are wanted in bigger tonnage than the industry probably ever has witnessed although with many mills having greatly increased their production, some manufacturers are scouring around to some extent seeking orders. Prices are steady nevertheless. Fine papers are in rather routine demand though reports say there has been some expansion of buying recently. No changes are noted in quotations, the market price level being maintained following the reduction in wood bonds and ledgers several months ago.

Box boards are enjoying a fairly broad market outlet. Demand in the West is said to be relatively better than in the East, with the result western mills are busier than are those situated in the East. The strike of paper box workers in New York City continues and this doubtless is affecting demand here to some degree. Board prices are well sustained without any changes of consequence reported.

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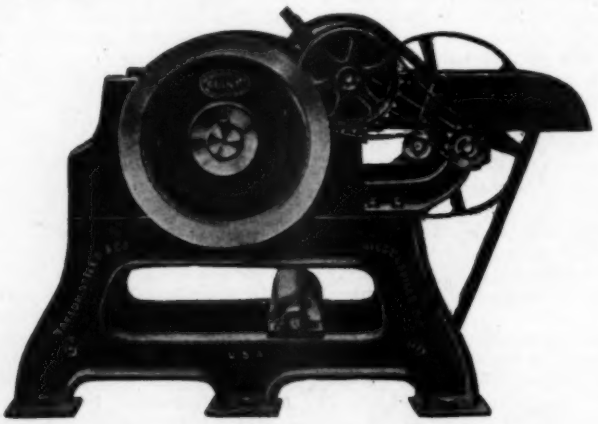

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Domestic Raw Materials

Papermaking Rags

The market for papermaking rags is strictly in favor of buyers, and there is little activity noted in any quarter. Business is along routine lines and at best involves principally small quantities of rags which paper manufacturers are absorbing to satisfy immediate needs. With the inventory period drawing near and most papermakers anxious to keep stocks of raw material on a low level, such buying of rags as is now being done is against immediate and actual requirements, and the market is characterized by a degree of dullness which causes dealers of long experience to state that not in years have they witnessed demand so quiet. As would be expected under these circumstances, the price trend is downward. No broad changes have occurred, but such revisions in market values as have been recorded have in practically every instance been in a declining direction. Some grades are in such little demand that dealers frankly say they do not know what such rags really are worth in the market.

There is little doubt that the change which has taken place in some branches of the paper manufacturing industry as affecting rag consumption is largely accountable for the prevailing dullness. It is admitted generally in the industry that fine paper mills are using fewer rags these days, sulphite bonds and ledgers having supplanted paper of rag-content in considerable measure in numerous consuming quarters—being the result of a more common use of sulphite papers because of the saving involved. In consequence, the consumption of old white and blue rags and of some grades of cotton cuttings has decreased to a marked extent; there are cases pointed to where certain fine paper mills which several years ago were extensive buyers of these rags are today but occasional buyers in a very small way. Dealers therefore have difficulty marketing the better qualities of old cotton rags and also some cuttings among paper mills for no other reason than mills require less of this stock.

There seems little or no question supplies of these better grades of rags available to paper manufacturers are smaller today than was the case a few years ago. The use of household accumulations of rags for the family automobile and the general increase in the use of rags for wiping purposes instead of cotton waste have eliminated many rags which formerly found their way into paper mills. This condition, however, has been easily offset by the decline in consumption of high-grade rags in the manufacture of paper, and also by the increase in importations of rags from European and other sources into the United States.

The demand for roofing rags has fallen off quite noticeably during the past month. This probably is a seasonal development; roofing paper mills are not busy since their business has decreased with the advent of the winter and the decline in building operations, and, evidently having no fear of not being able to get all the rags needed when their requirements broaden, are engaging in little purchasing at present. Prices of this class of rags appear to be getting down to where fundamental costs become a factor, and while the trend of the market is downward, there has been no further sharp decline in prices lately. Domestic roofing rags are quoted at about 1.70 cents a pound f.o.b. dealers' shipping points for No. 1 packing and 1.40 cents for No. 2 stock, while foreign dark-colored cottons are quoted by importers at 1.60 cents ex dock New York and foreign linsey garments at 1.75 cents.

Prices of old whites seem to depend on how anxious sellers are to secure mill orders. Demand, as stated, is very spotty, and lacking in volume. No. 1 repacked whites are available at 6 cents a pound at shipping points and perhaps at slightly under this price for some qualities, while No. 2 repacked whites are quoted at 3 to 3.25 cents. Repacked thirds and blues are offered at around 2.50 cents a pound at dealers' points, and rough blues at 1.75 cents.

Certain grades of new rags are moving in a limited way and at fairly maintained prices, though reports generally describe the market for such rags as a whole as dull. Dealers ask 11.50 to 12 cents a pound at shipping points for No. 1 white shirt cuttings, 5.75 cents for fancy shirt cuttings, 9.50 cents for white lawns, and 11.25 cents for unbleached muslins. Blue overall cuttings are available to mills at 7.50 cents f.o.b. shipping points, light silesias at 7.75 cents, and No. 1 washables at 5 cents.

Some business is reported in roofing mill grades, but otherwise foreign rags are mainly neglected by paper manufacturers. Linens are quiet, and the better grades of old cottons as well as new cottons are selling only in very spotty fashion. Prices abroad are holding up fairly well and this has a tendency to maintain market quotations here.

Average quotations f.o.b. shipping points and ex dock New York are as follows:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	11.50-12.00
White shirt cuttings, No. 2	8.00- 8.50
Fancy shirt cuttings	5.50- 5.75
Washables, No. 1	4.75- 5.00
Unbleached muslins	11.00-11.25
White lawns	9.25- 9.50
Overall cuttings, blue	7.50- 7.75
Black silesias	5.00- 5.25
Light flannelettes	9.00- 9.25
Canton flannels, bleached	9.25- 9.50
Canton flannels, unbleached	8.25- 8.50
Shoe cuttings, bleached	9.50- 9.75
Shoe cuttings, unbleached	8.50- 8.75
Light silesias	7.50- 7.75
O. D. khaki cuttings	5.50- 5.75
Mixed khaki cuttings	4.75- 5.00
Corduroy cuttings	4.00- 4.25
Cottonade cuttings	4.00- 4.25
Linens, No. 1 white, foreign	13.00-13.50
Light prints, foreign	2.75- 3.00
Old Stock—	
Whites, No. 1 repacked	6.00- 6.50
Whites, No. 2 repacked	3.00- 3.25
Whites, house soiled	2.00- 2.25
Whites, street soiled	1.85- 2.00
Lace curtains	6.00- 6.25
Thirds and blues, rough	1.65- 1.85
Thirds and blues, repacked	2.40- 2.60
Black stockings	3.75- 4.00
Cotton canvas, No. 1	5.00- 5.25
White cotton batting	3.00- 3.25
Roofing, No. 1	1.65- 1.75
Roofing, No. 2	1.35- 1.45
Linsey, garments, foreign	1.70- 1.80
Dark colored cottons, foreign	1.55- 1.65
Blue linens, foreign	4.00- 4.25
Gray linens, foreign	4.25- 4.50
White linens, foreign	8.00- 8.50
Light prints, extra, foreign	1.75- 2.00

Rope and Bagging

Prices of both old rope and bagging display a sagging tendency under a restricted demand from paper mills for these raw materials. Indications are domestic old manila rope is meeting with a fairly ready sale, yet consumers are buying in a manner which not only fails to sustain market values but which has a tendency to put prices down. Dealers assert available supplies of rope are small and that incoming lots from producing sources fall far short of normal volume, but this

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situation at the supply end is scarcely able to hold up prices owing to the proportionately less demand from paper mills. No. 1 domestic old manila rope is quoted at 4.75 cents a pound f.o.b. shipping points, and it is probable some buying has been done by consumers at a shade under this level, while foreign No. 1 manila rope is bringing only about 3.75 cents ex dock New York. Strings are quiet and are quoted at around 1.35 cents per pound for mixed strings, and 2 cents for sisal strings.

Scrap bagging of No. 1 grade has eased in price to where quotations range around 1.90 cents a pound f.o.b. dealers' shipping points, whereas roofing bagging is selling at 1.30 cents per pound. Gunny has declined sharply and No. 1 domestic is quoted at 3.25 cents a pound at shipping points and No. 1 foreign at 2.50 cents on the dock at American Atlantic ports.

F.o.b. shipping point and ex dock New York quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	3.25-3.50
Gunny, No. 1 foreign	2.25-2.50
Scrap bagging, No. 1	1.75-2.00
Roofing bagging	1.25-1.35
Wool tares, heavy	3.25-3.50
Wool tares, light	2.75-3.00
Manila rope, No. 1 foreign	3.75-4.00
Manila rope, No. 1 domestic	4.75-5.00
Sisal strings	2.00-2.25
Mixed strings	1.25-1.50

Old Paper

Not a great deal of change is recorded in prices of old paper, but the market trend is downward and some grades have eased further. Demand from consuming quarters is of limited scope. There are paper and board mills buying right along, but they do not appear over-keen for supplies and are placing orders for rather small tonnage; also most buying is done in the near vicinity of mills so that competition in acquiring supplies is more or less eliminated. It is declared that the sinking of prices of low grades down to cost levels has prompted many packers to drastically curtail collections, but no effects of this are visible on the market, though should consumers come into the market for larger supplies it probably would be an important and strengthening factor.

No. 1 old mixed paper is quoted in the East at 50 cents a hundred pounds f.o.b. New York, and folded newspapers at 60 cents, while ruling prices of these grades in the West usually are higher than these. Shavings are available to mills at 3.50 to 3.75 cents per pound at shipping points for No. 1 hard white and 2.85 to 3.10 cents for soft white shavings, depending on the quality of packing. Heavy No. 1 old books are selling at 1.05 to 1.15 cents a pound, and ledger stock on a price range of 1.40 to 1.65 cents. Old No. 1 kraft has declined to around 2.10 cents a pound at dealers' points, and white blank news is quoted at 1.60 to 1.70 cents per pound.

The following are quotations named by dealers f.o.b. shipping points:

	New York and Chicago
Hard white shavings, No. 1	3.50-3.75
Hard white shavings, No. 2	3.00-3.25
Soft white shavings	2.85-3.10
Colored shavings	.90-1.00
Heavy book, No. 1	1.05-1.15
Crumpled book No. 1	.85- .95
Ledger stock	1.40-1.65
Kraft, No. 1	2.00-2.15
Manilas, No. 1	.85- .95
White blank news	1.60-170
Overissue news, No. 1	.70- .80
Folded news	.60- .70
Sulphite mill wrappings	.75- .85
Mixed paper, No. 1	.50- .60
Common paper	.40- .50

Pulp Wood

Pulp wood demand is quite active and reports tell of a ready sale for practically all the supply offered and at steady prices. The price tendency, in fact, is upward. Grinders are looking about in various directions endeavoring to locate available

GDC

IF YOU are confronted with special color problems such as fastness to light, fastness to alkali or soap; or if you have two-sidedness troubles of delicate shades, let our newly equipped laboratories assist you.

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New York, N. Y.

GENERAL DYESTUFF CORPORATION

JOSEPH GATTI President and Treasurer

GATTI Paper Stock Corporation
Formerly with the Gatti-McQuade Co.

Paper Manufacturers' Supplies

COTTON AND WOOLEN WASTE

All Grades of Rags and Paper Stock, New Wrapping Paper, Box Board and Cordage

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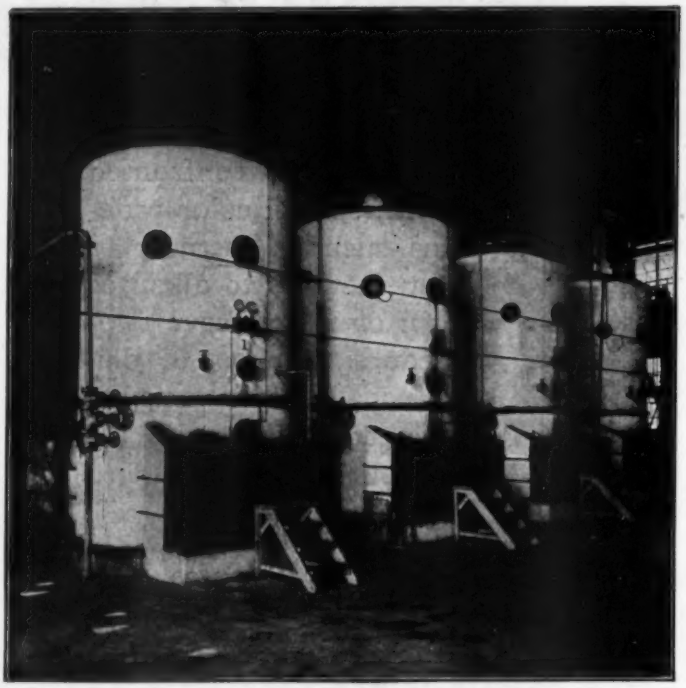
41 East 42nd St., New York
Liggett Bldg.

Packing House
13th and Monroe Sts.
Hoboken, N. J.

Western Paper Makers Chemical Company
Paper Makers Chemical Company

Kalamazoo, Mich. Holyoke, Mass. Easton, Pa.
Jacksonville, Fla. Pensacola, Fla. St. Austell, England

Rosin Size, Satin White, Clays, Fillers
Foam Killer, Felt Soap and Other Specialties



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EVAPORATOR

RECENTLY INSTALLED
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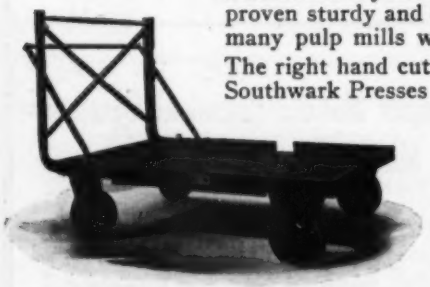
SOUTHWARK
HYDRAULIC PRESSES
for Pulp, Sulphite, Baling, Etc.
HYDRAULIC PUMPS, VALVES, FITTINGS, SHOCK ABSORBERS, PULP TRUCKS, ETC.



Southwark Pulp Truck, for Use with Presses Shown at the Right. Saves Time and Labor

Southwark Hydraulic Presses for dehydrating pulp have proven sturdy and efficient machines in every one of the many pulp mills where we have installed them.

The right hand cut shows an installation of four 600-ton Southwark Presses in a large pulp and paper mill. These presses are designed for use with Southwark Pulp Trucks, the trucks are loaded and run under the press, the pulp being compressed directly on the truck.

This feature gives fast operation, saves labor and eliminates curbs, boxes or other containers on the press.

Four 600-Ton Southwark Pulp Presses, Minnesota & Ontario Paper Co., International Falls, Minn.

SOUTHWARK FOUNDRY AND MACHINE CO.

AKRON, O.
100 E. South St.

400 Washington Ave.
PHILADELPHIA, PA.

CHICAGO
343 S. Dearborn St.

supplies, and it is stated considerable more activity would be noted in the market were larger amounts of wood to be had. A very firm market is anticipated throughout the winter, and some in the trade are predicting much higher market prices.

Imports of pulp wood into the United States during the first nine months of this year totaled 1,089,709 cords, compared with 1,241,885 cords in the same period a year ago. Exports of pulp wood from Canada in the first ten months of 1926, practically all of which came to the United States, amounted to 1,249,907 cords, valued at $12,590,638, contrasted with shipments aggregating 1,290,120 cords of a value of $12,842,564 in the corresponding time last year.

Mechanical Pulp

The market for mechanical wood pulp is very firm of tone. There is, in fact, a strong upward tendency in quoted prices, based on a decidedly limited available supply of ground wood in the open market and prospects of an even tighter supply situation developing as the winter wears on. When the heavy consumption of ground wood by newsprint mills for some months past is taken into consideration, it can be understood why so little pulp is offered to transient buyers at present. Most producers in the United States have themselves used nearly all the pulp manufactured, and grinders in Canada are well sold up and also have had less than usual tonnage to direct to the open market. Moreover, prices of Scandinavian ground wood have been above a parity with market levels here and therefore but limited supply has been imported into the United States from that source. Consumers who depend on transient buying to cover their wants are said to be experiencing much trouble at the moment in getting all the supply wanted, and it is felt in the trade that this situation will become accentuated later in the winter.

Domestic prime spruce ground wood, which is mainly nominal in price, is around a market level of $32 a ton f.o.b. pulp mills, while quotations on Canadian ground wood in a majority of cases are $29 to $30 per ton at grinding points. Scandinavian ground wood is quoted at $36 a ton or higher for dry pulp, ex dock American Atlantic ports, and around $39 or $40 for wet ground wood.

Production of ground wood in the U. S. during September amounted to 86,231 tons, compared with 75,140 tons in the preceding month, but despite this increase in output mill stocks at the end of September, amounting to 120,936 tons, were smaller than at the end of August, when they totaled 126,295 tons. Producing mills used 89,597 tons and shipped out 4,309 tons in September.

Chemical Pulp

Domestic wood pulp mills are fairly busy, and, according to reports, are well fixed with orders which should keep them well engaged over the turn of the year. The market tone is fairly firm, demand is developing in a steady though somewhat routine manner, and prices are holding in a more or less stationary position. It is reported that certain mill brands of some classes of pulp are meeting with excellent demand; in fact, that producers are rushed to fill the wants of their customers, and that sales of these pulps have been effected well ahead.

Bleached sulphite is quoted at 4 to 4.25 cents a pound f.o.b. pulp mills for the most popular prime grades, though some brands are fetching 4.50 and 4.75 cents per pound. In fact, the quotation on the well-known Alpha sulphite is reported to be 6 cents a pound f.o.b. pulp mill. No. 1 strong unbleached sulphite is steady in price at 2.90 to 3 cents at producing points, while book grade sulphite is quoted at 3.25 to 3.50 cents, and easy bleaching sulphite at 3.15 to 3.35 cents. No. 1 kraft pulp is bringing 3 cents or close to that figure at shipping points, and bleached soda pulp 3.75 cents.

Production of chemical pulp in the United States during September reached a total of 104,588 net tons, compared with 102,461 tons in the preceding month, 107,643 tons in July and 108,513 tons in June. Mill stocks at the end of September amounted to 21,075 tons of all grades of chemical pulp, against 21,206 tons at the end of August.

Quotations f.o.b. pulp mills are as follows:

Bleached sulphite	4.00-4.75
Easy bleaching sulphite	3.20-3.40

58% Soda Ash 76% Caustic Soda
Modified Soda Special Alkalies
Bicarbonate of Soda

Diamond Quality Alkalies are Nationally Distributed

THE Diamond Alkali Company is founded on the ideal of quality and service. ¶Its shipping facilities are unsurpassed, being centrally located to the great manufacturing centers and directly served by three trunk lines, assuring quick shipments over the shortest possible route. ¶Mixed carloads of alkalies are made up in any assortment required without extra cost to the consignee. ¶Local distributors maintain warehouse stocks for the convenience of consumers who require less than carload lots. ¶All this assures consumers a double quick delivery service of Diamond quality Alkalies in any quantity.

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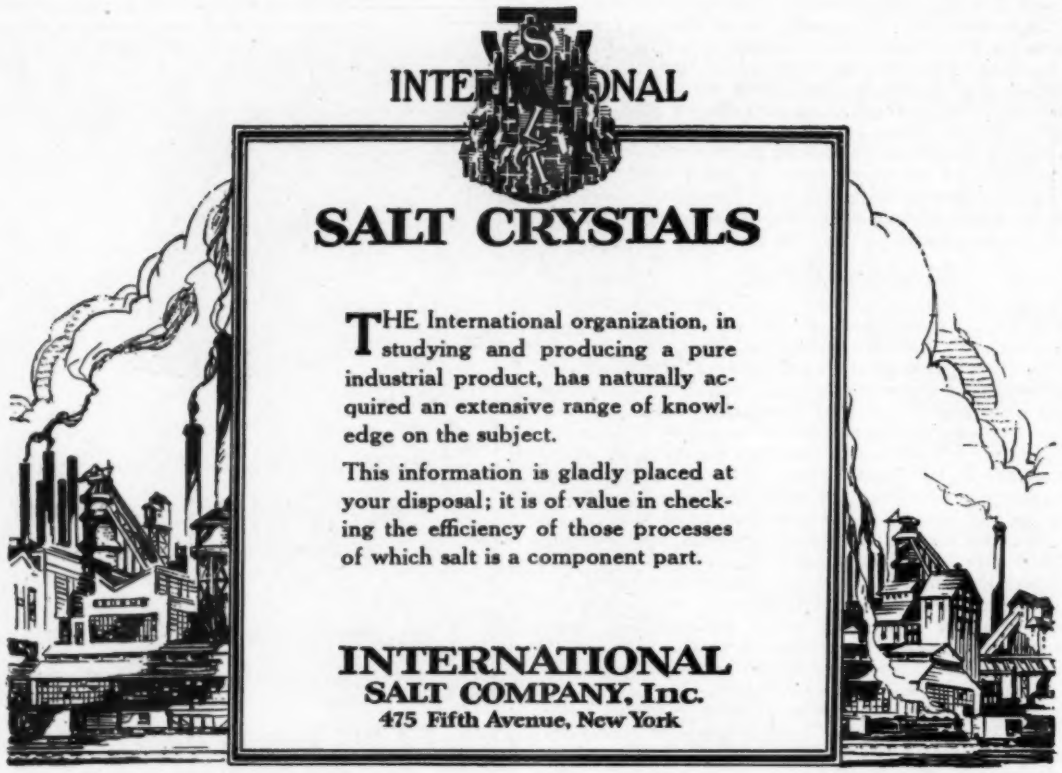
PITTSBURGH, PENNSYLVANIA



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SALT CRYSTALS

THE International organization, in studying and producing a pure industrial product, has naturally acquired an extensive range of knowledge on the subject.

This information is gladly placed at your disposal; it is of value in checking the efficiency of those processes of which salt is a component part.

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SALT COMPANY, Inc.
475 Fifth Avenue, New York

Uncle Jake says—

"When it comes to choosing paper I am a crank and I want to be known as a crank."

But the crankiest crank that ever cranked will approve

KVP BOND
it's watermarked

KALAMAZOO VEGETABLE PARCHMENT CO. KALAMAZOO, MICH.

New Papers

Writing—	
White rag	15-40
White sulphite	10-30
Colored rag	15-40
Colored sulphite	9-30
Ledger—	
White rag	16-40
White sulphite	11-30
Colored sulphite	10-30
Colored rag	15-40
Bonds—	
White rag	16-40
White sulphite	8-30
Colored sulphite	8-30
Colored rag	15-40
Book—	
No. 1 S. & S. C.	6.50- 8.00
Machine finished	6.25- 8.00
English finished	6.25- 8.00
Coated and enameled	8.00-14.00
Lithograph, M. F.	8.50-15.00
Newsprint—	
Rolls, contract	3.25- ....
Rolls, transient	3.50- ....
Sheets	3.75- 4.00
Side runs	4.00- 3.25
Cover Stock—	
Coated, both sides	10.25
Coated, one side	10.15
Tissue—	
No. 1 white, 20x30	.70- .80
No. 2 white, 24x36	.65- .75
No. 1 manila, 24x36	.65- .75
Kraft	.90- 1.00
Wrapping—	
No. 1 Kraft	6.00- 6.50
No. 2 Kraft	5.25- 5.50
Southern Kraft	4.75- 5.00
Boards—	New York and Chicago
Solid news	47.50-50.00
Straw	52.50-57.50
Plain chip	40.00-45.00
White coated chip	55.00-60.00
Manila coated chip	50.00-55.00
Binder's board	70.00-75.00

Chemical Pulp

(Continued from page 1625)

Unbleached sulphite, No. 1 strong (news grade)	2.90-3.10
Unbleached sulphite, No. 1 book	3.25-3.50
Soda pulp, bleached	3.75-4.00
Mitscherlich, unbleached	3.25-3.50
Kraft, No. 1	2.90-3.10
Screenings, refined	1.40-1.60

Chemicals

Casein prices have eased just a trifle to where some supply of domestic casein is reported available down to 14.50 cents a pound, though this is regarded as the bottom of the market at present. Imported casein is quoted at 15 to 16 cents per pound, duty paid. Bleaching powder quotations are unchanged at 2 to 2.40 cents per pound in large drums, f.o.b. works. Caustic soda is quoted a shade lower, or at 3 to 3.05 cents per pound at works for spot delivery in large drums.

Average quotations are as follows:

Alum, lump ammonia	3.50- 3.75
Alum, lump starch	3.75- 4.00
Blanc fixe, powder	4.25- 4.50
Bleaching powder	2.00- 2.40
Brimstone (long ton, at mine)	18.00-19.00
Casein (duty paid)	14.50-16.00
Caustic soda, spot delivery	3.00- 3.05
China clay, domestic washed	8.00-10.00
China clay, foreign	13.00-20.00
Rosin, grade E	13.10-13.20
Satin white	2.00- 2.25
Soda ash, 50 per cent light (bags)	1.38- ....
Starch, papermakers', in bags	3.42- ....
Talc (ton)	16.00-18.00

Newsprint Paper May Contain Sulphate Pulp

So called "standard newsprint paper" may be imported free of duty whether it contains sulphate pulp and sulphite pulp, according to a decision of the United States Customs Court, Second Division, which has been made public by the News Print Service Bureau in Monthly Bulletin No. 106, dated November 15, 1926. The term "standard newsprint paper" is said to be without definite or uniform trade meaning, and hence must be construed in its ordinary sense, as applying to newsprint weighing thirty to thirty-five pounds per ream of 500 sheets, 24x36 inches. Newsprint paper containing 80 per cent mechanically ground woodpulp and 20 per cent of sulphate pulp is held by the decision to be free of duty under paragraph 1672 of the Tariff Act of 1922.

The decision arose from a protest made against the levy of a duty of one-fourth of 1 cent per pound and 10 per cent ad valorem on a consignment of two cars of newsprint paper made from 80 per cent groundwood pulp and 20 per cent bleached sulphate pulp, the assessment of duty being made at the request of the importers in order to obtain a judicial decision as to the proper classification of paper.

The paper in question was made by the Wayagamack Pulp & Paper Co., and entered at the port of Ogdensburg for consignment to the *Post Standard* of Syracuse, N. Y. The paper was used in printing the daily morning editions of September 4, 1925, and subsequent dates, and was said to have run well on the printing presses with less than the usual amount of waste from breakage.

Special Issue of Finnish Journal

The Finnish Paper and Timber Journal, Helsingfors, Finland, has just published a special issue containing a large number of articles dealing with matters of actual interest for the wood-working industries.

Col. T. I. Aminoff, of the Finnish Sawmill Owners' Association, comments in English upon present conditions in the timber market. Other articles, written in English, deal with recent developments in the Finnish cellulose industry and with Trangsund, near Viborg, the largest timber shipping port in Europe.

Some other articles, such as Baron E. F. Wrede's interesting comments on the export possibilities of the Polish timber industry and Mr. G. K. Bergman's comprehensive notes on the bleaching process of wood pulp, are accompanied by English summaries. Most articles are profusely illustrated.

The Kalbfleisch Corporation, New York City, recently held its annual sales conference in the general offices of the company. The morning session was devoted to the Heavy Chemicals division, and the afternoon session to the Paper Chemicals division. In the evening, a banquet was held at the Prince George Hotel. The meeting was attended by all of the sales representatives of the corporation.

The B Q Co. Inc. QUALITY PULPS

"HAFSLUND BEAR"
Bleached Sulphite

"FORSHAGA"
Bleached Sulphite

"HURUM SPECIAL"
Extra Strong Kraft

KOOS BAC

"BAMBLE"
Extra Strong Kraft

The Borregaard Company
200 Fifth Ave. Incorporated New York, N.Y.

Sulphur

A FIRST REQUISITE
IN
Paper Making

Large Production
Ample Reserves
Prompt Deliveries
Purity 99½%

TEXAS GULF SULPHUR CO.
41 E. 42nd Street New York City
Mine Gulf, Matagorda County, Texas

Bleached and Unbleached
SULPHITES
KRAFT PULPS

Foreign and Domestic
GROUND
WOOD

PERKINS-GOODWIN CO.
NEW YORK
33 West 42nd St.

PAPER
PRINTING PAPER
OF
EVERY DESCRIPTION

EXPORTS

Exports of paper and paper products from the United States during the month of September underwent a quick recovery after the seasonal dullness of the summer months, the aggregate value of shipments amounting to $2,249,291 and thus exceeding any previous month of this year since April, as well as the value of the corresponding month of last year, according to the Paper Division of the U. S. Department of Commerce.

While most classes of paper shared in the improvement during September, marked gains were observed in shipments of writing and other fine papers and paper specialties. The heaviest gains in these lines were registered in tissue papers and in writing papers, including papeteries and envelopes. Exports of wrapping and sheathing papers also exceeded those made during the similar month a year ago, although showing a slight decrease in comparison with the preceding month. Shipments of paper board likewise showed a tendency to fall off under the volume of the August shipments, but were double those of the same month last year. Relatively few classes, however, showed a downward trend in the volume of shipments during the month of September. Conspicuous among these were exports of vulcanized fibre and manufactures, paper boxes and cartons, and paper bags, which have shown a tendency to decline since the first of the current year. Exports of newsprint, while exceeding the August shipments by nearly 20 per cent, were 25 per cent under those reported for September, 1925.

Exports of paper base stocks, which were valued at $319,393 in September, registered a decline of 10 per cent in comparison with the preceding month and of nearly 40 per cent contrasted with the same month a year ago. The greater part of these shipments consisted of sulphite wood pulp and rags and similar stock.

IMPORTS

Wood Pulp

Trade activity in imported wood pulp was on a rather reserved scale in November. There was business done, of course, but paper and board manufacturers in a majority of cases confined their buying to small tonnage against actual requirements, presumably having contracted in sufficient volume previously to cover their bulk needs over the first few months of the new year. In fact, most of the purchases recorded involved spot pulp in the United States, which was absorbed fairly readily, thus proving that demand was principally against direct requirements.

The market tone continues quite steady. Prices from abroad are holding their own and there appears to be somewhat of a rising tendency notwithstanding the falling off of demand. Conditions at primary sources in Europe are reported very strong. Mills in Scandinavia are said to be better sold ahead for next year than ordinarily is the case at this point in the pulp season, and demand from consuming quarters in the European countries is reported increasing. The coal miners' strike in England is gradually petering out and as paper mills in that country experience less of a handicap in securing fuel they are buying more wood pulp from Norway and Sweden. Another strong market factor is that Northern Europe is experiencing an unusually early winter this year. Severely cold weather has prevailed; in fact, it has been so cold that it seems practically a certainty navigation over the Baltic will close much earlier this winter than ordinarily. Advices at hand are to the effect it is likely the Baltic will freeze early in December, which will mean a stoppage of pulp shipments from the East coast of Sweden before much of the supply contracted for by American buyers is gotten out. Still another bullish factor is the scarcity of shipping tonnage in Europe. Pulp exporters in the Scandinavian countries are reported to be having a great deal of trouble effecting shipments because they are unable to secure the necessary space on cargo steamers. It is stated bids of $7 and $8 per ton have been made to steamship companies for space in which to ship pulp to the United States but that a dire scarcity of ship tonnage is available even at these prices which are almost 100 per cent over the usual cost of shipping pulp to this country. The main reason for the lack of cargo ships, it is stated, is the coal strike in England which has limited the available supply of coal for steamers and also has resulted in a good many vessels being utilized to carry coal from the Continent to England.

Imports of pulp into the United States during September recorded a substantial decline as compared with the several previous months, according to official statistics issued by the U. S. Department of Commerce. Total importations of chemical pulp of all kinds into this country in September amounted to 93,883 long tons, valued at $6,059,453, which quantity was almost identical with the imports in the same month last year, amounting to 93,723 tons, but were well below the 121,063 tons imported in August last and also under the 115,572 tons imported in July this year and 122,238 tons in June of the current year. September imports of chemical pulp brought the total for the first nine months of 1926 up to 929,549 long tons, giving a monthly average of 103,283 tons, contrasted with an average of 98,279 tons monthly in the corresponding period last year. Imports of ground wood in September were 28,367 tons, valued at $959,415, compared with 22,122 tons of a value of $644,146 in the same month a year ago, and making a total for the first nine months of this year of 191,012 tons, against 205,978 tons in the same time of 1925.

Bleached sulphite of prime quality is selling at 3.80 to 3.85 cents per pound ex dock New York or other American Atlantic ports although special brands are quoted at 4 cents and well in excess of this latter price for some qualities. Prime strong unbleached sulphite is quoted around 3 cents a pound on the dock at New York, prime easy bleaching sulphite at 3.30 to 3.40 cents, and ordinary Mitscherlich unbleached sulphite at 3 cents to slightly higher. Standard prime Swedish kraft pulp is quoted at 2.95 to 3 cents in a majority of instances and a couple of dollars per ton more frequently is asked for some mill brands.

Current market quotations ex dock New York and receipts at the port of New York during November follow:

Bleached sulphite, No. 1	3.80- 4.25
Unbleached sulphite, strong, No. 1	3.00- 3.30
Unbleached sulphite, No. 2	2.75- 3.00
Easy bleaching sulphite	3.30- 3.40
Mitscherlich unbleached, genuine	3.35- 3.60
Mitscherlich unbleached, ordinary	3.00- 3.15
Kraft, standard Swedish	2.95- 3.20
Ground wood, per ton (dry)	37.50-40.00

Atterbury Bros., 5,000 bls. from Oslo; E. J. Keller Co., 340 bls. from Hamburg; M. Gottesman & Co., 693 bls. from Hamburg and 2,300 Sundsvall; Tidewater Paper Mills Co., 8,040 bls. from Murray Bay, 7,454 Chatham, 6,219 Seven Islands and 6,415 Clarke City; Banca Commerciale Italiana, 330 bls. from Hamburg; Johaneson, Wales & Sparre, 2,064 bls. from Gothenburg, 1,650 Hernosand, 300 Hamburg and 1,910 Sundsvall; E. M. Sergeant Co., 1,273 bls. from Gothenburg, 630

BATHURST LUMBER COMPANY, LIMITED

PRICE & PIERCE, LTD.
17 East 42nd Street, NEW YORK CITY

ARE NOW THE

SELLING AGENTS
for Bathurst Pulp in the United States

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

The Pulp and Paper Trading Co.
21 East 40th Street New York City

DEALERS IN DOMESTIC CHEMICAL AND MECHANICAL PULPS AND PAPER

AGENTS FOR
J. & J. Rogers Company, Ausable Forks, N. Y.
E. B. Eddy Company, Ltd., Hull, Canada

Canadian Kraft Limited, Three Rivers, Canada
Dealers in Wayagamack Kraft Pulp

Howard Smith Paper Mills, Montreal, Quebec
EASTERN AGENTS of Sulphite Pulp. Made by
Port Huron Sulphite & Paper Co., Port Huron, Mich.

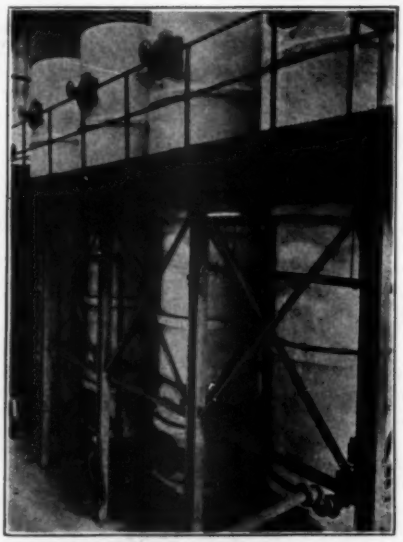
J. ANDERSEN & CO.
21 East 40th Street New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden

IMPROVED BADGER
BLACK LIQUOR EVAPORATORS

Recent Installation
NORTHWEST
PAPER CO.
Cloquet, Minn.



NON-FOAMING

MAXIMUM
STEAM ECONOMY

NO ENTRAINMENT

SODA and
SULPHATE
PROCESSES

E. B. BADGER & SONS CO., Boston, U. S. A.

See page 314 in the 1926 Paper and Pulp Mill Catalogue

Oslo and 2,700 Hamburg; Price & Pierce, 1,900 bls. from Gothenburg; Central Union Trust Co., 2,275 bls. from Greaker and 800 Oslo; Philadelphia Girard National Bank, 250 bls. from Greaker; J. Andersen & Co., 1,050 bls. from Greaker, 135 Trieste and 1,244 Hamburg; A. P. W. Paper Co., 12,574 bls. from Sheet Harbor; Castle & Overton, 567 bls. from Bremen and 184 Rotterdam; Parsons & Whittemore, 300 bls. from Gothenburg; Bulkley, Dunton & Co., 408 bls. from Trieste, 3,450 Gefle, 2,100 Sundsvall, 600 Hamburg and 800 Rotterdam; Buck, Kiaer & Co., 4,800 bls. from Oslo; Pagel, Horton & Co., 2,250 bls. from Gefle; Chemical National Bank, 900 bls. from Oslo; Scandinavian Pulp Agency, 825 bls. from Gefle, 1,850 Sundsvall and 26 Rotterdam; National City Bank, 500 bls. from Copenhagen; W. Van Doorn, 171 bls. from Rotterdam; Equitable Trust Co., 110 bls from Antwerp and 253 Hamburg; Lagerloef Trading Co., 217 bls. from Bremen; Chase National Bank, 800 bls. from Oslo; Order, 1,060 bls. from Hamburg, 5,263 Kotka, 990 Sundsvall, 1,200 Bremen and 200 Oslo.

Paper Stock

Judging from arrivals through the port of New York, importations of papermaking materials other than wood pulp into the United States during November declined rather sharply. There was a particularly noticeable decrease in imports of rags, shipments arriving at New York probably being smaller than in any month in a long time. Imports of old rope, bagging and miscellaneous paper stock also were exceptionally light, reflecting a quiet market condition and a relatively higher price level in Europe than in this country.

Imports of all kinds of paper stock other than wood pulp through the port of New York in the month of November, 1926, these data being taken from manifests of steamers arriving at that port during the month, follow:

Old Rope

William Steck & Co., 80 bls.; Brown Bros. & Co., 197 coils; S. Birkenstein & Sons, 84 bls. and 31 coils; Ellerman's Wilson Line, 200 coils; E. J. Keller Co., 428 bls.; National City Bank, 138 bls.; Equitable Trust Co., 80 coils; W. Schall & Co., 46 coils and 118 bls.; Bulkley, Dunton & Co., 27 bls.; H. F. Reed, 60 bls.; American Trading Co., 21 bls.; Order, 19 bls. and 2 reels.

Old Bagging

Castle & Overton, 238 bls.; E. Mayer, 157 bls.; Bank of New York & Trust Co., 123 bls.; Brown & Roese, 37 bls.; Irving Bank and Trust Co., 1,177 bls.; J. M. Johnson, 72 bls.; W. Schall & Co., 126 bls.; Equitable Trust Co., 760 bls.; Bulkley, Dunton & Co., 306 bls.; George M. Graves Co., 67 bls.; Anchor Line, 37 bls.; E. J. Keller Co., 1,486 bls.; Order, 786 bls.

Rags

Stone Bros. Co., 328 bls.; S. Birkenstein & Sons, 320 bls.; Daniel M. Hicks, Inc., 273 bls.; S. Silberman Co., 1,271 bls.; Darmstadt, Scott & Courtney, 134 bls.; Jaffe Products Co., 55 bls.; Castle & Overton, 254 bls.; Victor Galaup, Inc., 83 bls.; I. Hinerfeld, 39 bls.; William Steck & Co., 59 bls.; Royal Mfg. Co., 21 bls.; Paul Barlowitz, 545 bls.; J. A. Brookman Co., 46 bls.; Daniel I. Murphy, Inc., 488 bls.; E. Mayer, 375 bls.; Atterbury Bros., 36 bls.; Bulkley, Dunton & Co., 433 bls.; E. Butterworth & Co., 192 bls.; S. Rubens & Bro., 34 bls.; Atlas Waste Mfg. Co., 5 bls.; Gebruder Meyer, 132 bls.; J. Cohen & Sons Co., 23 bls.; E. J. Keller Co., 1,655 bls.; Bank of New York & Trust Co., 125 bls.; Irving Bank and Trust Co., 77 bls.; New York Trust Co., 226 bls.; National City Bank, 259 bls.; Fidelity International Trust Co., 32 bls.; Central National Bank, 207 bls.; Anglo-South American Trust Co., 204 bls.; Chemical National Bank, 82 bls.; American Exchange-Pacific National Bank, 406 bls.; The Barrett Co., 221 bls.; A. C. Fetterolf, 46 bls.; U. S. Forwarding Co., 62 bls.; American Overocean Corp., 99 bls.; A. W. Fenton, Inc., 451 bls.; Brown Bros. & Co., 285 bls.; Amsinck, Sonne & Co., 30 bls.; Gallagher & Ascher, 47 bls.; W. Schall & Co., 139 bls.; C. R. Spence & Co., 154 bls.; Order, 1,914 bls.

Miscellaneous Paper Stock

Castle & Overton, 103 bls.; Standard Products Corp., 72 bls.; E. Butterworth & Co., 63 bls.; International Mercantile

"Distinguished for its high test and uniform quality."

Soda Ash

Caustic Soda

Bicarbonate of Soda

MICHIGAN ALKALI CO.

General Sales Department

21 East 40th St., New York, N. Y.

Chicago Office
332 South Michigan Ave.

HIGH SPEED

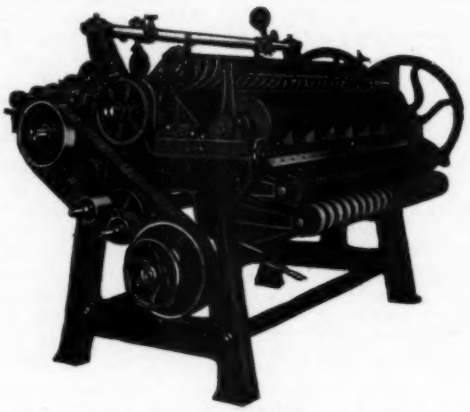
FOLDING MACHINES

FOR

NAPKINS *and* PAPER TOWELS

Paper Converting Machine Company

GREEN BAY WISCONSIN



PAPER CUTTERS

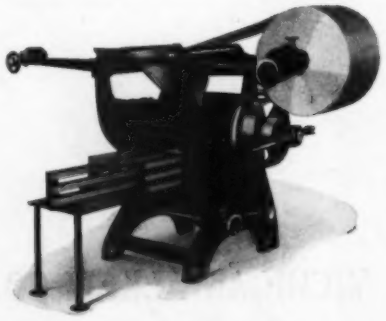
Single—Duplex—Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

HAMBLET MACHINE CO.
LAWRENCE, MASS.

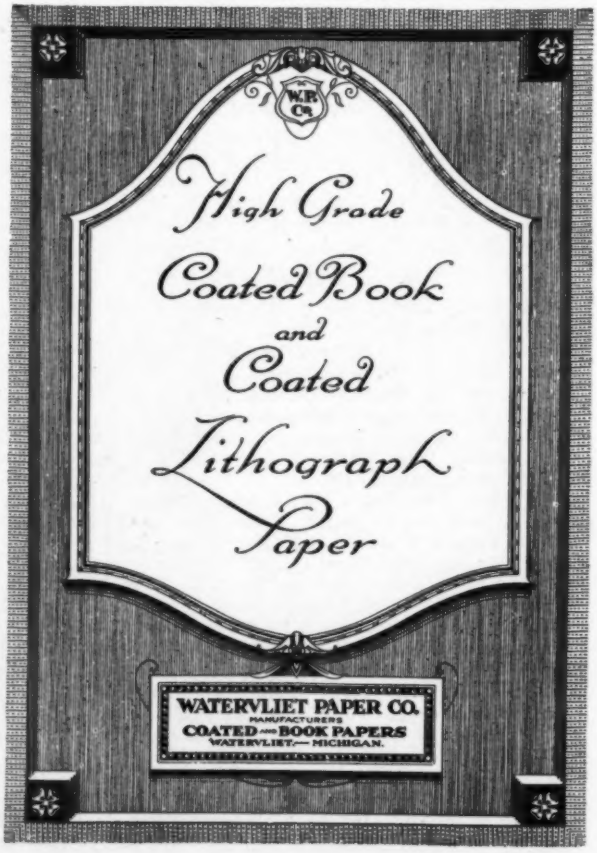
Adjustable Napkin Folders

400 to 500 Folded Napkins per Minute



A simple and compact machine, adjustable to fold napkins ranging from twelve to fourteen inches. Ball bearing throughout. Equipped with printing unit if so desired.

Hudson-Sharp Machine Co.
GREEN BAY, WISCONSIN
Chicago Office: 574 Wrigley Building



Marine Co., 42 bls.; Maurice O'Meara Co., 27 bls.; Daniel M. Hicks, Inc., 19 bls.; New York Trust Co., 24 bls.; J. Cohen & Sons Co., 13 bls.; Milton Snedeker Corp., 115 bls.; Garfield National Bank, 29 bls.; Anglo-South American Trust Co., 62 bls.; William Steck & Co., 21 bls.; British Bank of South America, 17 bls.; F. S. Smith & Son, 14 bls.; George M. Graves Co., 51 bls.; Order, 165 bls.

Paper

Imports of paper into the United States during November were fairly large, judging from receipts through the port of New York. While these data are unofficial, they indicate that importations of most classes of paper were at least up to the quantities received in the several previous months. Some sizeable shipments of newsprint arrived, and usual amounts of wrapping, cigarette, hanging and other kinds of paper were received. Imports of paper of all kinds through the port of New York last month, these data being taken from manifests of steamers reaching that port, follow:

Printing

Parsons & Whittemore, 337 rolls from Raumo; Martin & Bechtold, 10 cs. from Bremen; Keuffel & Esser Co., 101 rolls from Hamburg; E. Dietzgen & Co., 67 cs. from Hamburg, 141 rolls from Copenhagen and 24 cs. from Rotterdam; Watch Tower Bible & Tract Society, 74 reels from Kotka; Oxford University Press, 8 cs. from Liverpool; B. F. Drakenfeld & Co., 44 cs. from Liverpool; Royal Bank of Canada, 9 bls. from Hamburg; Perkins-Goodwin Co., 78 bls. and 93 rolls from Hamburg, 10 rolls Antwerp and 32 rolls Rotterdam; F. Henjes, Jr., 59 reels from Hamburg; A. Leffler, 38 reels from Gothenburg; O. Ray, 510 reels from Gothenburg; Maurice O'Meara Co., 462 cs. from Bremen; H. Reeve Angel & Co., 589 reels and 149 cs. from Bremen and 248 reels Hamburg; Perry-Ryer & Co., 66 cs. from Leith, 12 cs. Bremen and 62 cs. Glasgow; Box Board & Lining Co., 95 reels from Bremen; Star Co., 510 reels from Gothenburg; P. C. Zuhlke, 102 cs. from Antwerp and 5 cs. Rotterdam; National Consumers Paper Corp., 22 bls. from Hamburg; Southern Pacific Lines, 5 bls. from Hamburg; Bank of Montreal, 6,298 rolls from Corner Brook, N. F.; J. Henschel & Co., 4 cs. from Hamburg; Order, 448 reels from Kotka and 1,840 reels and 83 cs. from Bremen.

Wrapping

C. Steiner, 7 cs. from Hamburg; E. L. Garvin & Co., 3 cs. from Antwerp; Bendix Paper Co., 10 cs. from Hamburg; C. K. MacAlpine & Co., 30 bls. from Gothenburg; Arkell Safety Bag Co., 180 rolls from Gothenburg; Universal Paper Co., 15 rolls from Gothenburg; Standard Underground Cable Co., 23 rolls from Bremen; Okonite Callendar Cable Co., 244 reels from London; Borregaard Co., 60 bls. from Gothenburg; W. Hartmann & Co., 141 bls. from Hamburg; Rohner, Gehrig & Co., 49 cs. from Hamburg; W. C. Sullivan & Co., 14 cs. from Hamburg; Commonwealth Bank, 25 cs. from Hamburg; F. C. Strype, 18 cs. from Antwerp; Blauvelt-Wiley Paper Mfg. Co., 108 bls. from Glasgow; Royal Bank of Canada, 50 bls. from Genoa.

Cigarette

Standard Products Corp., 502 pkgs. from Havre and 45 cs. Southampton; Surburg Co., 18 cs. from Havre; R. J. Reynolds Tobacco Co., 200 cs. from Havre and 1,760 cs. from Bordeaux; British-American Tobacco Co., 5 cs. from Liverpool; P. J. Schweitzer, 46 cs. from Marseilles and 32 cs. Havre; American Tobacco Co., 1,200 cs. from Bordeaux; De Manduit Paper Corp., 572 cs. from Bordeaux; Southern Pacific Co., 3 cs. from Havre.

Drawing

Keuffel & Esser Co., 30 cs. from Hamburg, 7 cs. Rotterdam and 4 cs. Southampton; H. Reeve Angel & Co., 3 cs. from London.

Filter

A. Giese & Son, 8 cs. from Hamburg and 32 bls. Bordeaux; H. Reeve Angel & Co., 32 cs. from London and 60 cs. Southampton; E. Fougera & Co., 82 cs. from Southampton.

Writing

Guibont Freres & Co., 21 cs. from Havre; Coenca-Morrison

WAUSAU SULPHATE FIBRE CO.
MOSINEE, WISCONSIN
TRADE MARK
COPYRIGHTED

Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

MOSINEE

presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

Mosinee Kraft

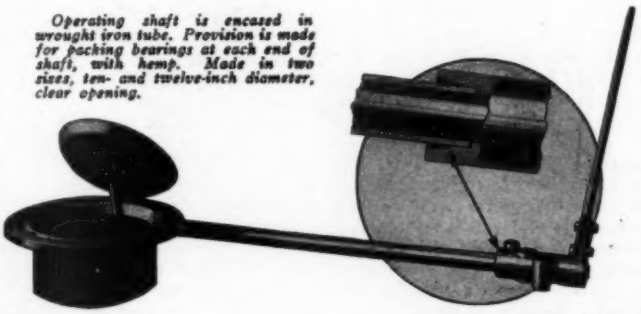
"The Wrapper that Delivers the Goods"

From the Outside—

No "fishing" and "poking" around the inside of the beater tub. This new dumping valve is constructed to operate from the outside of the tub. May be made either right or left hand by simply reversing two small bronze bushings.

Brass valve seat and lid are correctly proportioned. The valve in general is durable, easily operated and installed, and is positive in action.

Operating shaft is encased in wrought iron tube. Provision is made for packing bearings at each end of shaft, with hemp. Made in two sizes, ten- and twelve-inch diameter, clear opening.



DAYTON GLOBE IRON WORKS, **Dayton, Ohio**

Paper Mill Wire Cloth

Wisconsin Wire Works

APPLETON, WIS.

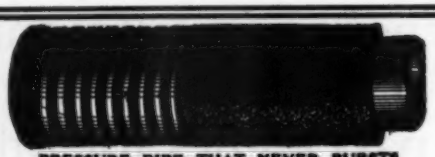
Robins Conveying Systems

FOR HANDLING BULK MATERIALS

Write for Handbook of Conveyor Practice

ROBINS CONVEYING BELT COMPANY

New York Chicago Pittsburgh Boston



PRESSURE PIPE THAT NEVER BURSTS
Built in sizes 1 inch to 48 inches

WYCKOFF WOOD PIPE

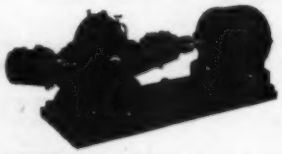
The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for White Water, Paper Stock, and Acids that can be obtained

WRITE TODAY FOR CATALOG AND PRICES

A. WYCKOFF & SON COMPANY

1855 Elmira, N. Y., U. S. A. 1926

CENTRIFUGAL PUMPS FOR THE PAPER INDUSTRY



The Bethlehem Horizontal Centrifugal Pump is of the double-suction, single-stage type with horizontal split casings. Capacities 200 to 17,000 gallons per minute against heads of 20 to 250 feet.

BETHLEHEM STEEL CO., *General Offices,* BETHLEHEM, PA.

District Offices

New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland

BETHLEHEM

Ham Feltz sez:

"Payin' a little extra to get the best wet felt you kin find is one way to cheat the coal pile. It's cheaper to let the water run through a high grade Hamilton felt than to sweat it out of the paper with high cost steam. Check it up as I've done and you'll find it a case of only dimes against dollars."

Hamilton Felts

THE HOME OF STEEL SHELL BURRS

AND

YELLOW JACKET SHOWERS

All Products Guaranteed to Suit You

F. W. Roberts Manufacturing Company

Read the "ROBERTS IDEA"

Lockport, N. Y. **Niagara Falls, Ont.**

Co., 3 cs. from Southampton; E. Dietzgen & Co., 16 cs. from Southampton; Abraham & Straus, 4 cs. from Hamburg; Eleto Co., 3 cs. from Southampton; J. Kennedy, 10 cs. from Havre; Marshall Field & Co., 32 cs. from Havre.

Tissue

W. J. Byrnes & Co., 8 cs. from Liverpool; Schenkers, Inc., 45 cs. from Hamburg; F. C. Strype, 31 cs. from Liverpool; S. Haufling & Co., 50 bls. from Hamburg.

Hanging

F. J. Emmerich & Co., 46 bls. from Hamburg, 10 bls. Liverpool, 8 bls. Antwerp and 26 bls. London; C. A. Haynes & Co., 58 bls. and 36 cs. from London and 62 bls. Liverpool; A. C. Dodman, Jr., Inc., 132 cs. from Southampton, 259 cs. Liverpool and 59 bls. Antwerp; H. C. Hackney, 39 rolls from London; Baldwin Universal Co., 11 bls. from London.

Photo

Globe Shipping Co., 225 cs. from Bremen; Gevaert Co., of America, 26 cs. from Rotterdam and 346 cs. Antwerp; J. J. Gavin & Co., 5 cs. from Liverpool; Amersvoll Co., 3 cs. from Bremen; P. C. Zuhlke, 41 cs. from Antwerp; Order, 5 cs. from Hamburg and 67 cs. Antwerp.

Board

A. Bourjois & Co., 33 cs. from Havre; Coty, Inc., 90 cs. from Havre; Bendix Paper Co., 11 cs. from Hamburg and 8 cs. Bremen; Haas Bros., 352 reels from Rotterdam; Schiffenhaus Bros., 102 reels from Rotterdam; Adrian Vuyck, 1,290 reels from Rotterdam; Perkins-Goodwin Co., 704 rolls from Rotterdam; J. P. Heffernan Paper Co., 433 reels from Rotterdam; O. M. Baxter, Inc., 27 cs. from Gothenburg; C. K. MacAlpine & Co., 10 bls. from Gothenburg; V. Neustadt, 7 cs. from Hamburg; Metropolitan Import & Mfg. Co., 10 cs. from Hamburg and 15 cs. Bremen; Devoe & Raynolds Co., 4 cs. from London; First National Bank of Brooklyn, 90 reels from Rotterdam; Brooks Paper Co., 6 cs. from Liverpool.

Miscellaneous

C. B. Richard & Co., 5 cs. from Bremen; Keller-Dorian Paper Co., 24 cs. from Havre, 45 cs. Southampton and 12 cs. Hamburg; International Clearing House, 32 cs. from Havre and 34 cs. Southampton; H. DeMangin & Co., 19 cs. from Havre; Hirschbach & Smith, 4 cs. from Havre; Japan Paper Co., 14 cs. from Havre, 5 cs. Southampton, 59 cs. Naples and 65 cs. Genoa; Hoble Service Co., 6 pkgs. from Havre; Whitfield Paper Works, 31 cs. from Kobe; P. H. Petry & Co., 17 cs. from Hamburg and 4 cs. Rotterdam; International Forwarding Co., 14 pkgs. from Hamburg, 3 cs. Rotterdam and 5 cs. Leghorn; Pennsylvania Railroad Co., 57 cs. from Hamburg; F. C. Strype, 121 cs. from Hamburg and 3 cs. Southampton; H. Brocklebank, 3 cs. from London; Whiting-Patterson Co., 14 cs. from Southampton, 11 cs. London and 6 cs. Hamburg; S. Gilbert, 41 cs. from Rotterdam; Globe Shipping Co., 17 cs. from Rotterdam; D. C. Andrews & Co., 69 cs. from Hamburg; Schenkers, Inc., 3 cs. from Bremen; Hensel, Bruckman & Lorbacher, 3 cs. from Bremen, 5 cs. Rotterdam and 117 cs. Havre; R. F. Downing & Co., 26 cs. from Havre and 6 cs. Hamburg; S. Lisk Bros., 5 cs. from Kobe; P. Pattinson, 10 cs. from Antwerp; Bendix Paper Co., 6 cs. from Hamburg; Richardson Bros., 3 cs. from Liverpool; Dollar Steamship Line, 4 cs. from Havana; F. L. Kraemer & Co., 3 pkgs. from Havre; Heemsoth, Basse & Co., 13 pkgs. from Rotterdam; W. Hartmann & Co., 14 rolls from Rotterdam; Caldwell & Co., 13 cs. from Rotterdam; E. Walker, 34 bls. from Hamburg; F. B. Vandergrift & Co., 4 cs. from Hamburg; Irving Bank and Trust Co., 35 cs. from Hamburg; Causon & Montgolfer, 107 cs. from Havre.

The Metropolitan Life Insurance Co., New York City, has recently underwritten group life insurance for four paper mills. The mills are: The Ogdensburg Pulp & Paper Co., Ogdensburg, N. Y.; the De Grasse Paper Co., Pyrites, N. Y.; and the High Falls Paper Co., Chateaugay, N. Y.; and the Brown Co., Berlin and Gorham, N. H., and La Tuque, Que.

The American Nickel Corporation has announced that effective December 1, 1926, the name of the company will be changed to the American Mond Nickel Co. The officers and personnel will remain unchanged.

MITTS & MERRILL

Conveyor or Gravity Feed Shredder

THE operation of a beater, with its wear and tear and tremendous power consumption, has one primary purpose, namely, hydration. Anything that will economically bring about hydration more quickly relieves the beater just that much, cuts down on operating costs and speeds the process of paper making.

The Mitts & Merrill Shredder performs on magazines, books, old paper and boxboard, frozen or dried pulp laps, roll and sheet stock, in such a way as to greatly reduce their resistance to hydration when they reach the beater. It gives the beater an economical lift.

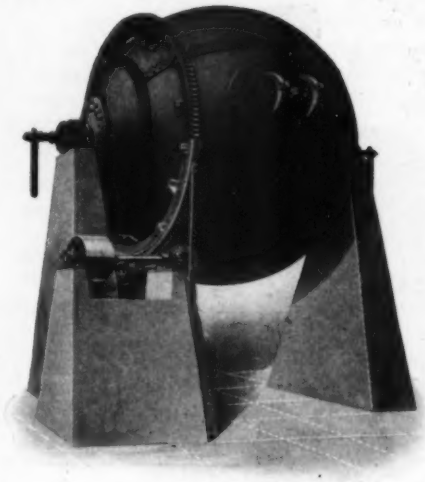
Our Shredders are built in sizes with spouts ranging from 18″ to 45″ wide. We will be glad to quote you on any size adapted to your requirements.

We also build a 100% efficient "Hog" to reduce pulp mill bark and wood refuse.

MITTS & MERRILL

1013 Tilden Street, Saginaw, Mich.

Production Every Minute



STANDING the gaff—delivering safety, uninterrupted performance—the kind that keeps your mill moving on "schedule" —that's what Manitowoc equipment ASSURES YOU. It has every requisite to back it up.

Because Manitowoc Digesters, Incinerators, Diffusers, Lime Recovery Kilns, Disc Evaporators, Barking Drums, Refiners, etc., are built up to a high standard, they perform economically and increase mill efficiency. And because they are designed and constructed to meet the exacting conditions of your mill, they assure you low operating costs.

Let our engineers design time-saving equipment for your mill. Write for special bulletin covering paper mill equipment.

MANITOWOC ENGINEERING WORKS, Manitowoc, Wisconsin

MANITOWOC

UNION

The Union Sulphur Co.

Main Offices:
FRASCH BUILDING, 33 RECTOR STREET
NEW YORK CITY

SULPHUR

1864 1926

"Excelsior" Felts

For EVERY GRADE of PULP & PAPER

We continue to maintain at the top the quality of Excelsior Felts, as we have done since we, as pioneers, made *the first endless paper machine felts manufactured in America.*

Seamless felts for fast running.
Satin Style felts for finish.
Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

Sold by
BULKLEY, DUNTON & COMPANY
75-77 Duane Street, N. Y.
and direct

Foreign Trade Opportunities

Additional information regarding the following foreign trade opportunities issued by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce may be obtained from the Bureau in Washington, D. C., or its branch offices. It is requested that the number of the inquiry be given at all times.

No. 22684—Wrapping paper. Mazatlan, Mexico. Agency desired.

No. 22683—Paper for the manufacture of milk bottle disks. London, England. Purchase desired.

No. 22695—Pulp and paper mill, small, complete plant, both chemical and mechanical processes. Mafil, Valdivia, Chile. Purchase desired.

No. 22761—Papermaking machinery. Montreal, Canada. Purchase desired.

No. 22771—Composition fiber in sheets, tubes and form pieces. Vienna, Austria. Purchase desired.

No. 22757—Machinery for cardboard and paper manufacturing. Berlin, Germany. Purchase and agency desired.

No. 22772—Paper, manifold and bond, in various weights, and correspondence guide cards. Montreal, Canada. Purchase desired.

No. 22761—Sulphate of ammonia and other papermaking chemicals. Montreal, Canada. Purchase desired.

No. 22891—Machine felts for papermaking. Oslo, Norway. Agency desired.

No. 22888—Paper bags, 4-ply for cement. Copenhagen, Denmark. Agency desired.

No. 22873—Pasteboard boxes and paper cups and spoons. Pernambuco, Brazil. Purchase desired.

No. 22844—Paper cups, sanitary. Munich, Germany. Purchase and agency desired.

No. 22894—Fiber board, vulcanized, hard and flexible. Antwerp, Belgium. Purchase desired.

No. 22821—Newsprint paper. Colombia, South America. Agency desired.

No. 22886—Newsprint paper and stationery for job printer. Lourenco Marques, Portuguese East Africa. Purchase desired.

No. 22889—Printing and packing paper and colored tissue paper in large quantities. Valetta, Malta. Agency desired.

No. 22885—Bleached sulphite pulp for making rayon. Lyons, France. Agency desired.

No. 22891—Bleaching powder, salt cake and sulphate of alumina. Oslo, Norway. Agency desired.

No. 22858—Sulphur. Hamburg, Germany. Purchase desired.

No. 22956—Over-issued newspapers. Canton, China. Agency desired.

No. 22989—Paper. Managua, Nicaragua. Agency desired.

No. 22988—Paper, especially newsprint. Merida, Yucatan. Agency desired.

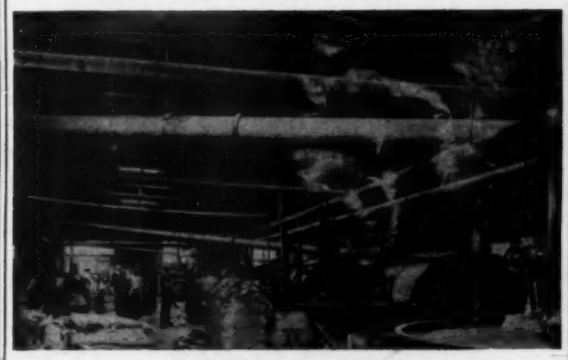
Chief Engineer Promoted to Superintendent

Edward Rootes has resigned as superintendent of the Chicago paper mill of the Container Corporation of America, which was formerly the Chicago Mill and Lumber Co.'s plant, and Thrond Thompson, formerly chief engineer of this mill, has been made superintendent.

It is not often that a man in the engineering department finally works up to the position of superintendent in a paper mill, but Mr. Thompson has shown such fine ability in his work as chief engineer that we are sure he is going to make the ideal superintendent. He is a man of tremendous force and ability, the type of man that will get every pound of product that the plant is capable of producing.

The Chicago Belting Co., Chicago, announces that Mr. F. Royal Gannon has joined their organization as manager of the New York Factory Branch. Mr. Gannon was formerly assistant manager of the Semi-finished and Wire Department of the Bethlehem Steel Co.

The William Ganschow Co., Chicago, have appointed Mr. Harold D. Mitchell, former chief engineer of the Sumet Corporation, Buffalo, as sales representative in the western half of New York state. Mr. Mitchell's office will be at 1543 Fillmore Ave., Buffalo.



Overhead Lines in paper plant

Overhead Pipe Lines

SUCCESSFUL overhead pipe lines have been made possible with "Michigan" Combination Steel and Wood Pipe. A special steel flange fitting eliminates the ordinary leaks and troubles.

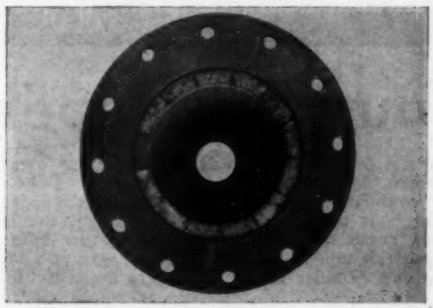
This flange fits over the tenon of the pipe and is used simply as a connection. No metal is exposed to the liquid, which keeps it free from specks of rust to harm the paper.

"Michigan" Combination Steel and Wood Pipe is made of seasoned wood, reinforced with spirally wound steel bands. The steel exterior is protected by two coats of asphaltum, applied hot. There is no chance for corrosion or bursting under pressure.

"Michigan" pipe is stronger, more durable, and has 20% greater carrying capacity than iron pipe.

The number of paper mills using "Michigan" pipe is increasing daily. It is found best for conveying white water, sulphite, ground wood and pure water.

Send us your blueprints and we will gladly furnish estimates on pipe and fittings to suit your requirements.



End view of Special Flange Coupling. Note metal outside

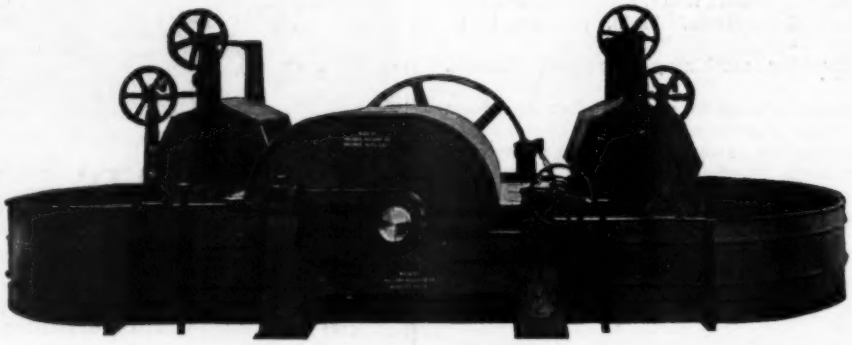
Tell us about your piping problem. If necessary, one of our engineers will gladly call and go over it with you. Remember, every piece of pipe and every bit of work is guaranteed.

MICHIGAN PIPE CO.

Dept. 17 BAY CITY, MICH.

Holyoke Machine Co., Holyoke, Mass.

Makers of Improved Machinery for Wood Pulp and Paper Mills



Washing and Beating Engines, Wood Pulp Grinders, Barkers, Chippers, Rag and Paper Dusters, Rag Cutters, Hydraulic Pumps and Presses, Hercules Water Wheels and Governors, Super-Calenders, Platers, Cotton and Paper Rolls.

You Can Depend on Biggs Rotaries

PAPER MILLS send orders to Biggs as a matter of course.
That confidence in us doesn't come from advertising, neither is it because of cut prices to get the business. It's the result of years in giving the paper industry the best possible equipment and quick delivery at a fair price. Globe and cylinder bleaching boilers made by Biggs are as good now as they always have been. That's our guarantee of satisfaction.

If you haven't our book on Biggs Rotaries send for it today.

Remember we also specialize in Digestors and Penstocks as well as special steel tank fabrication.

THE BIGGS BOILER WORKS COMPANY SENECA PLACE AND CASE AVENUE Akron, Ohio

The Biggs Boiler Works Co. Akron Ohio — Trade Mark Registered

GLOBE and CYLINDER
ROTARY BLEACHING BOILERS
for Years of Dependable Cooking and Bleaching